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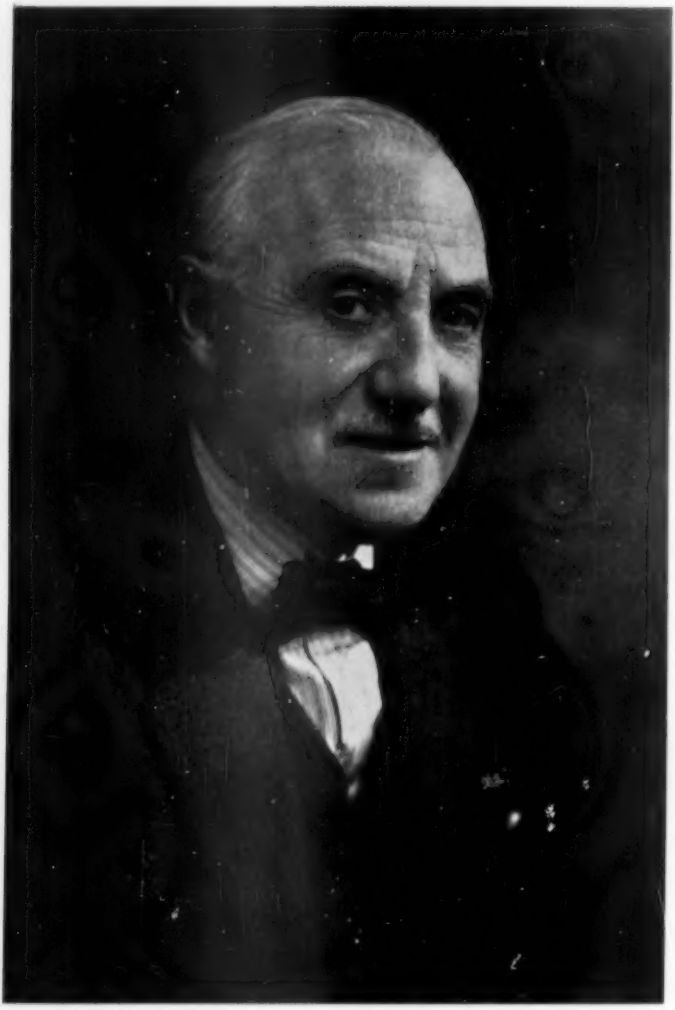

ALAN GRANT OGILVIE

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ALAN GRANT OGILVIE

ALAN GRANT OGILVIE is a name that will long be honoured by the Royal Scottish Geographical Society and throughout the world wherever the science of geography is taught. He was born in Edinburgh in 1887, only child of Sir Francis and Lady Grant Ogilvie. His father had held important administrative posts at the Heriot-Watt College and the Royal Scottish Museum, moving later to the South Kensington Museum, London, and was one of the original founder members of the Royal Scottish Geographical Society in 1884. From his childhood, Alan had a passionate interest in geography inspired in no small measure by his contacts with Dr A. J. Herbertson, that great pioneer in the subject, then working in Edinburgh.

His earliest schooling was at George Watson's College, Edinburgh, from which he moved to Westminster School and then to Magdalen College, Oxford, where he graduated B.A., M.A. and B.SC. Postgraduate studies he carried out in Berlin University, the Imperial College of Science, London, and the Sorbonne, Paris. From 1912 to 1914 he was joint Demonstrator in Geography at Oxford, but with the outbreak of war he volunteered for service, gaining his Commission in the 7th London Brigade of the R.F.A. After service in France, Dardanelles and Salonika, he was promoted to the General Staff and rendered valuable service to the Intelligence Section at the War Office and later to the British Peace Delegation in Paris. He was granted the O.B.E. (MILITARY DIVISION).

In 1919, he was appointed Reader in Geography at Manchester, and in 1920 he became head of the Hispanic American Division of the American Geographical Society of New York. When Dr George G. Chisholm, first Lecturer in Geography at Edinburgh, died in 1923, Ogilvie was appointed his successor. A year later the lectureship was raised to a readership and, in 1931, was established as the first Chair of Geography in Scotland. The latter event was, with justice, regarded as a great triumph by this Society for, from its earliest days, it held the foundation of such a Chair to be one of its most important aims in developing the study of geography in Scotland.

Professor Ogilvie's contributions to geographical science are dealt with elsewhere in this issue, and it is well known how, in the 23 years that followed, he built up the reputation of that Chair. Indeed he established it in a position unsurpassed in this country and respected in every land where the study of geography is taken seriously. He never allowed himself to wander from the principle that physical geography forms the basis and starting point of the many subsidiary natural sciences affecting the life of man on this earth.

As might be expected from a man of his energy, his contributions to the life of the Royal Scottish Geographical Society were of dynamic importance. From 1925 to 1940 he served as joint Honorary Secretary, taking a leading part in the Jubilee Celebrations of 1934, an occasion when the late King George VI, as Duke of York, presided at the Anniversary Meeting and at the banquet which followed. From 1946 to 1950 he occupied with distinction the office of President, his presidential address covering "Transcontinental Travel by a Geographer in America". He was awarded the Society's Research Medal in 1944 and the Livingstone Gold Medal in 1950. He represented the Society on the National Committee for Geography, the National Institute of Oceanography, and the National Trust for Scotland, and served as its representative on various international congresses. In 1934 he occupied the Presidency of Section E of the British Association, and in 1951 and 1952, that of the Institute of British Geographers.

Ogilvie's death took place in tragic and sudden circumstances at a meeting of the Society, held on February 10th of this year. His loss will be widely felt by the large circle of friends he had built up in almost every land. The younger generation of geographers he helped to train learned to regard him with that same respect and affection as did his older friends. As a man he was a tireless worker, devoting himself with thoroughness to whatever subject of study he undertook. Faithfulness, indeed, may be said to have been the key-note of his life, faithfulness in small things as well as in great. It is thus we shall wish to remember him.

JOHN BARTHOLOMEW (President)

LIKE most other senior British geographers, Alan Grant Ogilvie turned first to geography after graduating in something else, in his case in history at Oxford in 1909. But his postgraduate training was unusually comprehensive and stimulating, and its influence markedly pervades his thought and work. In Berlin he had the advantage of hearing Albrecht Penck lecture on landforms, while in the following year he was able to attend the course given at the Sorbonne by W. M. Davis as exchange professor. There, too, he doubtless made contact with Lucien Gallois and gained first-hand familiarity with French regionalism. Under these influences Ogilvie learned to reason analytically about the systematic aspects of geography and to think synthetically about regions, and the fruits of this training were soon seen. In April

1912 he read to the Research Division of the Royal Geographical Society a paper on Morocco that was rightly appreciated by the few who heard it as both novel and important. Unable to visit Morocco himself, he had collected and collated all the information about the country available in the *Bibliothèque Nationale* in Paris and had presented the results in the form of a synthetic regional account which was warmly commended by Mill, Herbertson and Myres. Morocco being then much in the news, Ogilvie was asked to deliver an evening lecture on the subject in January 1913, and this was remarkable for the effective use then made of Davis's technique of the block-diagram as a basis for systematic description.

In the meantime another important formative influence had become operative. In the late summer of 1912 Ogilvie was one of the three delegates named by the R.G.S. who were the guests of the American Geographical Society in the transcontinental excursion which that Society arranged to celebrate its own 60th birthday. On that excursion, which was planned and conducted by W. M. Davis, Ogilvie was in company with such men as Partsch, Brückner, Gallois, Chaix, de Margerie, de Martonne and Schokalsky, and there is no doubt that from them he derived a more 'continental' view of geography than was generally current in Britain at the time. He also formed personal friendships with them that endured: and it was, for example, in Ogilvie's house that I myself met Schokalsky in 1937. Returning to Oxford and a 'Junior Demonstratorship' under Herbertson, Ogilvie was now acclaimed as "one of the most promising of our younger geographers." He was awarded the Albert Kahn Fellowship for 1914-1915 but was prevented by the outbreak of war from setting out on the world tour it was intended to provide for. Next year he was the recipient of the Cuthbert Peek Grant of the R.G.S., but he was already in uniform and spent the later years of the war map-making in the Aegean and Macedonia. In 1919 he succeeded John McFarlane at Manchester with the title of Reader in Geography, but in January 1921 he joined the staff of the American Geographical Society to initiate an ambitious programme of research, map-compilation and monograph-writing inspired by Isaiah Bowman. When the programme was well and truly launched with one sheet of the Millionth-map of Hispanic America published, four others completed, twenty on the stocks, and the monograph *The Geography of the Central Andes* in print, he came to Edinburgh to take up the lectureship laid down by G. G. Chisholm, and in Edinburgh as lecturer, reader and professor he remained to work, to write, to teach and to inspire, until death abruptly overtook him in the midst of his labours.

Ogilvie's earlier writings reflect the duality of influences that we have remarked in his training and are broadly divided between systematic topics in physical geography and synthetic regional studies. Field studies in geomorphology early claimed his attention, and his work on the shore forms of the Moray Firth broke new ground and is not yet superseded. His object in such studies was emphatically the explanatory description of existing landforms, and he therefore always had a lively concern for the better representation of landforms on

topographic maps and for the development of special maps which would effectively portray the results of geomorphological interpretation. His 1921 map of the physiography of part of Macedonia was a venture of this kind which has found many followers. In rather analogous fashion he was anxious to see other elements of the physical environment satisfactorily mapped, and especially was he concerned about the mapping of vegetation. His interest in this subject was early revealed when he chose to make his contribution to the R.G.S. symposium on the American Geographical Society's Transcontinental Excursion on " Impressions of the Vegetation of the U.S.A." ; and it was to the mapping of land use and vegetation that he turned in his last considerable piece of field work when the University of Edinburgh granted ' sabbatical ' leave in the summer of 1935.

More important, however, are Ogilvie's contributions to regional geography, and these are of several sorts. There are several descriptions of areas studied on the ground which are models of their kind, and they range from regions as contrasted as Macedonia and the Isle of Imbros on the one hand to New York City and region or industrialised Central Scotland on the other. Quite remarkable are the descriptions of areas which Ogilvie was never able to visit in the field. The experience gained from his early essay on Morocco was turned to conspicuous advantage when he wrote *The Geography of the Central Andes* from a survey of all the literature that could be assembled in New York, a work that earned him the Milne-Edwards silver medal of the Geographical Society of Paris. At least one class of Ogilvie's students has refused to believe that he never saw the Andes with his own eyes, and anyone who reads the descriptive portions of his presidential address to Section E of the British Association at its 1934 meeting will agree that his power of geographical visualisation was impressive. For that address was a highly successful demonstration of his contention that, since the world is large and geographers are few, our understanding of regions such as tropical Africa may be more securely based on answers to geographically framed questions collected by non-geographical observers on the spot than by geographical extrapolation at a distance however brilliant. But whether he wrote about a region he saw with his own eyes or through the eyes of others, whether he expounded to his own students the geography of a remote continent or a familiar view from the Pentland Hills, his method remained the same. He treated each relevant aspect of the natural environment in turn—even in his description of New York he has something to say on vegetation and agriculture—to demonstrate the " interplay of all these physical elements " before passing on to study " the reactions of man as shown by his modifications of the land surface." In less competent hands the method has often made of regional geography a mere regional catalogue, and one reviewer of *The Geography of the Central Andes* saw a potential danger in the tendency " to discuss as ' Geography ' the whole range of scientific study for which data are available in the area under discussion." In Ogilvie's hands both these dangers were avoided, because his descriptions were always informed by a fine sense of relevance based on a deep belief in the

unity—the *Zusammenhang*—of geographical phenomena. In his clear perception of the regions he described as complex unities now existing —and in his view always to be described in the present tense—he escaped the British tendency to be drawn into lengthy discussions of origins, whether of landforms or human institutions. Some indeed would criticise his regional geography as underestimating the legacy of the historic past in the present. And though in none of his writings is it ignored, it is true also that he came latterly to give it much more weight in the regional synthesis. His presidential address to the Institute of British Geographers (1952) on "The Time Element in Geography" is eloquent of this.

Other British geographers have written more voluminously under regional titles, but few, if any, have more consistently grappled in published work and in class teaching with the problem of regional exposition. He might fairly be called 'the' British regional geographer and his passing leaves a gap not soon to be filled.

DAVID L. LINTON

FROM their earliest contact with Professor Ogilvie, his students became aware of his clarity of expression, his scholarly breadth of vision, his devotion to the cause of Geography and, also, to themselves. The first-year student was invariably accorded a courteous greeting on chance encounter, and on request for an interview, the professor would always make time to see him. His case, however mundane, would be heard with close attention, and he would be sure of shrewd counsel and, if need be, of active support. Under the Professor's stimulating influence, the honours student would set himself an exacting standard and strive to attain the balanced liberal point of view, the logical and systematic approach. Professor Ogilvie appealed to the best in his students by his faith in them, and respect for them as persons. In turn, his strong personality, his integrity, won their esteem and devotion.

As long as his health remained robust, he participated with zest in departmental excursions and social activities. Excursions led by him were characterised by masterly exposition in the field, and leavened by his genial and witty conversation in the evenings. More intimately will his students recall his charming and unassuming manner, and his thoughtful concern for their well-being. The kindly hospitality of Professor and Mrs Ogilvie infused university life with greater friendliness.

His students will remember with pride their association with an outstanding geographer, acknowledge his enduring inspiration, and feel the loss of a beloved teacher and friend.

A STUDENT

[A bibliography is given on pages 34-35.]

A REPORT ON THE LOCHABER, APPIN, AND BENDERLOCH FLOODS, MAY 1953

By Robert Common[*]

On the morning of the 25th May 1953, the Scottish Press reported on the damage, caused by a severe thunderstorm, which had occurred

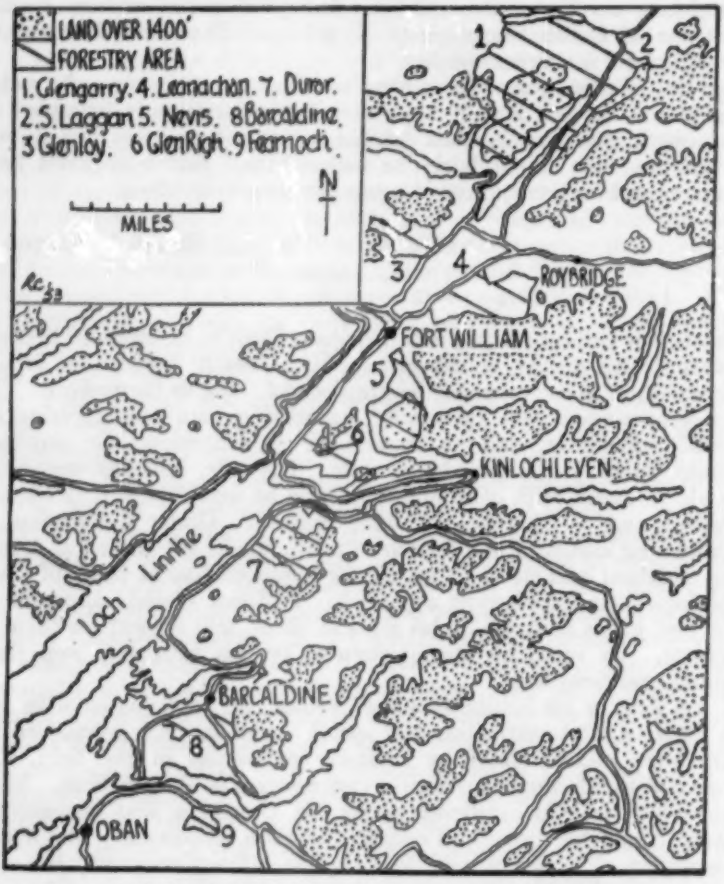

Fig. 1. Lochaber, Appin, and Benderloch. (Crown Copyright reserved.)

overnight in South Inverness-shire and North Argyllshire. The area affected (Fig. 1) forms part of the deeply dissected Grampian Highlands [1] where absolute and relative relief are high, and the effects of Quaternary glaciation are strikingly displayed. Dissection of the higher ground to the ridge state is common, but there appear to be distinctive summit groupings at 4000-3600 ft, 3300-3000 ft, 2300-1900 ft, and 1600-1100 ft. Whilst it is possible to correlate some of the more outstanding

topographical features with distinctive rock types or geological structures, these alone will not suffice to explain the two dominant trends in relief, that is, W-E and NE-SW, or the disposition of summits. One must, therefore, give due consideration to the part played by subaerial processes in fashioning the present landscape [2] and recognise the possibility of some, at least, of the topographical anomalies being the results of diffluent ice.

Meteorological conditions over the area became unstable in the lee of a warm front which passed over it early on the 24th May, for a cold

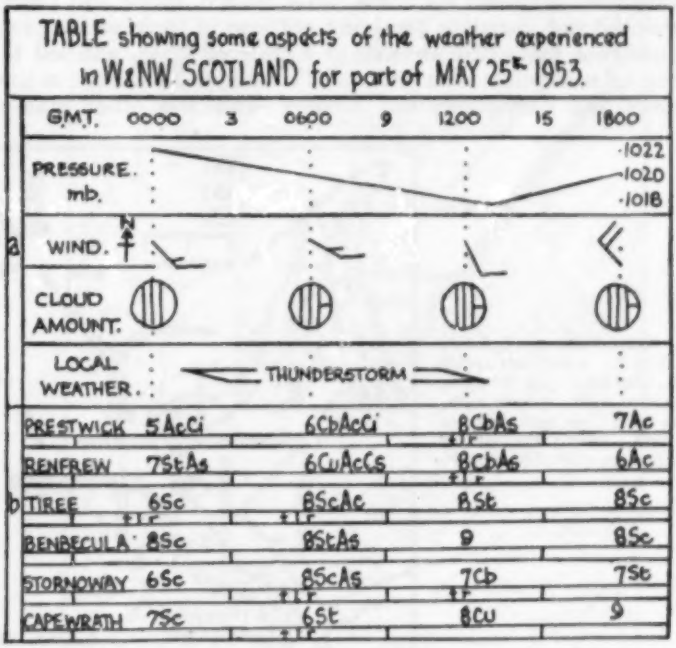

Fig. 2. Some aspects of the weather, part of May 25, 1953 (from DWR) : (*a*) General indication of the weather in the area under consideration. (*b*) Cloud amount and type at selected stations in adjacent districts. In addition, periods of thunder (t), lightning (l), and rain (r) in association are indicated. (Standard symbols and abbreviations employed.)

front was approaching from the west whilst very warm air was being drawn in from the south. The build-up of convection clouds, the onset of thunder and lightning and the downpour of rain were not confined to this area alone (Fig. 2), but physical conditions were especially favourable here for the resultant inundation and damage. Amongst these favourable conditions must be included the high relief index of an area near the western seaboard, the widespread occurrence of markedly ice-steepened valley sides, the general absence of effective checks to run-off, and the lack of protection to sloped ground which greater number of trees would have afforded. Furthermore, the thunderstorm was here at its worst, and during its ten-hour duration

the rainfall intensity reached its peak after the ground had time to become thoroughly saturated. As diagram 3 suggests, the bulk of the precipitation which led to damage had fallen by 0900 hours, 25th May, with the greatest amounts being recorded by stations situated east of and near Loch Linnhe. Some indication of the rainfall intensity is available from figures [3] recorded at Fort William and Kinlochleven. At the former, the heaviest occurred between 0350-0730 hours, with 1·53 in. falling between 0350-0550 hours, whilst at the latter, 2·6 in. fell in about seven hours on the morning of the 25th May. This excessive rainfall caused the rivers Nevis, Salach, Duror and Laroch to rise quickly and inundate low-lying portions of their valleys, swelled the numerous mountain torrents to a state of spate, and led to the scarring of susceptible sites with new landslides. Damage to lines of transport and communication, forestry land and other man-made

Fig. 3. Rainfall amounts between 0900 G.M.T., 23rd, and 0900 G.M.T., 26th May 1953: (1) 0900, 23rd, to 0900, 24th. (2) 0900, 24th, to 0900, 25th. (3) 0900, 25th, to 0900, 26th. Inset: Positions of a cold front for part of May 25th.

features was inescapable, for in most instances their only location lay at or near the base of steep, and often long, slopes.

Beginning in the Great Glen near Invergarry and working southwards to Connel, there was ample opportunity to examine landslides in varying stages of development and under different site conditions.[4] Before considering the slides proper, it is worth commenting upon the amount of material brought downhill alongside Loch Lochy. North east of Invergloy (Fig. 4), on and near the road, approximately 6000 tons of debris were removed by the Inverness Roads Department. To shift this amount, three excavators, three bulldozers, and men and lorries were kept busy almost continuously for ten days. Since such movements of large quantities of superficial materials were a characteristic feature of the storm, the long-term effect of similar phenomena upon the valley-forms merits consideration, and so, too, does the

nomenclature of the resultant composite deposits.[5] More pressing than these, however, is the need to recognise that these phenomena will recur at intervals, but not of necessity with such destructive results, if we profit by experience.[6, 7]

The sources of slides along the east side of the Great Glen, above Loch Lochy, occur at heights between 1800 ft-1000 ft, on slopes of at least 20° and more frequently on slopes of about 30°. Whilst the upper

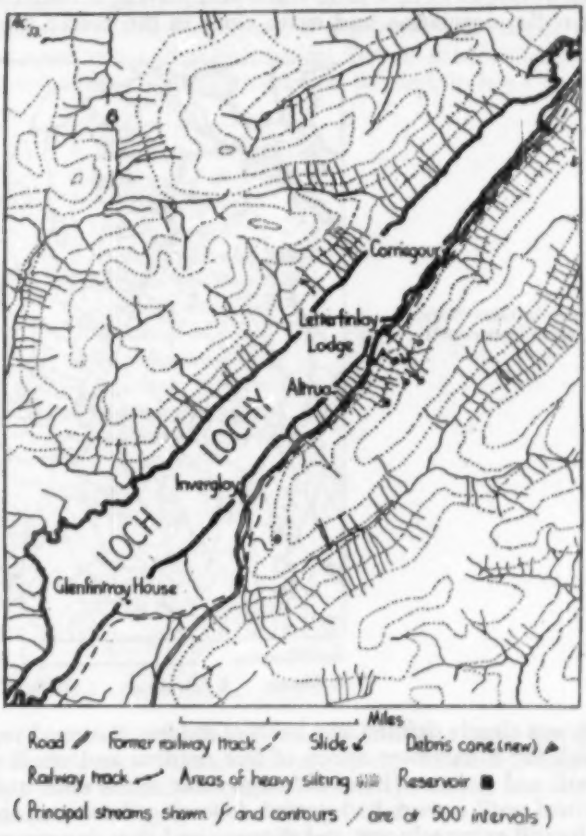

Fig. 4. Loch Lochy : Areas affected by flooding in May 1953. (Crown Copyright reserved.)

height limit of other slide sources examined in the area remained at about 1800 ft, it was found that slides frequently began at heights below 1000 ft, so that there was no hard-and-fast rule about the lower limit of slide sources. Despite variation, it is possible to suggest a sequence of development stages, beginning with the appearance of sinuous tension cracks or tears. Generally such tears appeared on the uphill side of wet ' flushes ', and in them both vertical and lateral displacements were manifest. It was obvious at the time of examination

that any recurrence of optimum conditions would 'trigger off' the sodden masses below many of these tears and lead to subsequent stages in slide development—further landslides occurred in the area a month later, but the writer has not yet been able to check on their precise location. In the next stage, the source of the slide was defined by a low vegetation and soil rim, enclosing a roughly circular or elliptical area. A degree of scouring had taken place, causing the removal of finer material downhill to form a slide track and leaving a rough surfaced residue of rocks, vegetation and earth clods in the source area. The

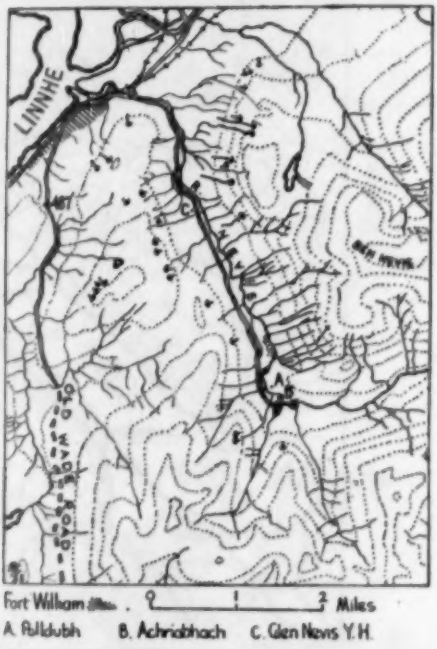

Fig. 5. Slides in Glen Nevis.
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slide track was clearly defined as a band of sodden, flattened vegetation upon which lay a narrower apron of fine detritus and small sporadic heaps of soil and stones. (Even although some of the slide tracks were not examined until a week had passed, following the storm, they were found to be still extremely wet and slippery and thus dangerous underfoot.) The penultimate stage involved a still greater scouring of the source area, particularly at the uphill end, together with basal sapping of the soil headwall. The contents of the slide track were more abundant and heterogeneous, whilst partial development of sod levees were occasionally seen. The examples examined at this stage in the Great Glen showed roughened rock-head (grey schist) amidst a jumble of disintegrated bed-rock, the whole set in a thick, dark brown, gravel-like paste. By contrast, the sources of comparable slides in Glen Nevis (see Fig. 5) were better scoured, for here the beautifully ice-smoothed rock-head offered an easier surface for the mass movement of overlying

material. The final stage appeared to have been reached in a slide examined south-east of Fort William (Fig. 6). In this example it was noted that enlargement of the source area had been under way at the time that processes were active. At one side several new tension cracks had formed, whilst at the opposite side earth bulging had possibly occurred. The headwall was sapped to a depth of four feet, leaving a three feet thick overhang, and on the downhill side large clumps of vegetation and soil had been moved outwards. The largest clump so moved measured 6 ft×4 ft×3 ft, and it was from these clumps that lesser fragments were torn and rolled, before further subdivision and rolling occurred downhill. The slide track was flanked, in large part, by well

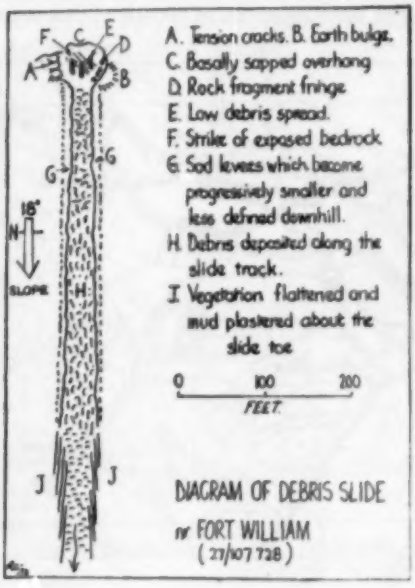


Fig. 6. Diagram of debris slide near Fort William.

defined sod levees which, like the contents of the track, became finer towards the slide toe. At the slide toe, in this example, running water had eroded itself a shallow tract to mark the initial stage of stream development.

The tension cracks examined were of lengths between 20 ft and 40 ft, and the displacements recorded ranged from 1 ft - 6 ft. Slide source areas varied in diameter from 15 ft - 50 ft, and the height of their confining rims generally rose uphill from a few inches to 2 ft - 8 ft at the headwall. Initially, the width of the slide track was invariably smaller than the diameter of the slide source, but further downhill other factors became operative. Where the slide or avalanche flowed and petered out in a nearly constant slope, the width of the slide track did not appear to alter greatly. Only one case was observed in which the greater part of a slide track lay on a decidedly steeper slope than its source (40° cp. 18°), and here, too, the track width remained constant.

Again, slide tracks which fed into and along the line of pre-existing gullies or torrents usually only displayed a little spreading. As might be anticipated, in such cases, the torrent courses and gullies were subjected to increased erosion along their upper tracts, but blockages and spreads developed at nick points and where the talwegs became gentler. The passage of a slide track from steep to gentler slopes was invariably accompanied by spreading and, if there was sufficient material, the formation of a debris cone at the slide toe. Good examples of such debris cones were found on the right bank of lower Glen Nevis and also along the south side of Loch Creran (Fig. 7). In the latter area, one mile west of Balliveolan, one of these was 200 ft wide, 6 ft high and in it the largest boulder measured 8 ft×5 ft×4 ft.

Especially favoured sites for the development of debris slides were

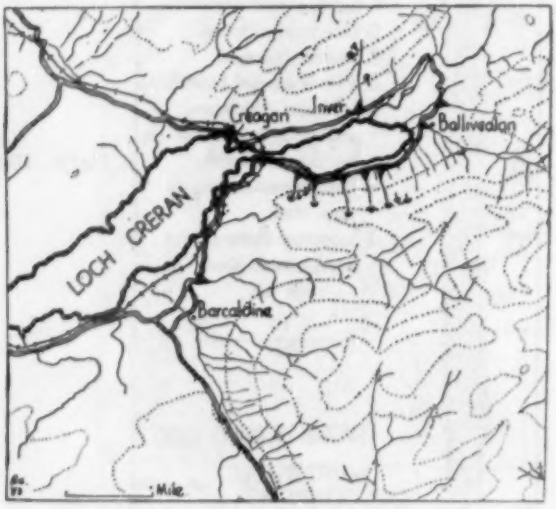


Fig. 7. Debris slides at the head of Loch Creran. An additional nine slides in the Barcaldine Forest are not plotted. (Crown Copyright reserved.)

well watered ' flushes ' on hillsides, even though the slope value was as low as 18°. Equally favoured were glacially smoothed and oversteepened slopes which offered reduced drag to saturated and water-lubricated superficial material. On the other hand, where glacial erosion had produced roches moutonnées and broken slopes, for example the north side of Glen Nevis, east of Polldubh, and/or differential erosion rates had occurred to produce discontinuous and often confused slopes, for example about the inner waters of Loch Leven, then slide development was inhibited or absent. Other most important factors which have prevented or reduced slide development in the area are the lack of depth in suitable overburdens and the presence of established trees in number. More will be written about trees in another section, but the reader can now quickly compare the number and length of slides on timbered and non-timbered slopes in figures 4 (W cp. E side of Loch Lochy) and 5 (W cp. E side of lower Glen Nevis).

Above Letterfinlay Lodge and Altrua (see Fig. 4) there are numerous youthful gullies which also served as channels for the downhill transfer of large quantities of debris. Examination of several showed that here, too, the plastering down of vegetation or its removal had occurred on the lower banks. In addition, a train of stones often defined the level at which the spate waters had flowed *longest*, whilst the ubiquitous gravel-like paste was invariably present on recently flooded tracts. Indeed, field evidence suggests that it was singularly fortunate that, on the untimbered lower slopes, the line of the old Fort Augustus railway lay above the main road. This track and its disused bridges acted as a buffer to landslide and swollen torrent alike, but even so the floodwaters frequently possessed sufficient surplus energy to carry parts of their load into the road bridges below. Where the modern road bridges had low clearances they quickly caused

Fig. 8. Debris slides in Appin. Slides in Glen Duror and Glen Coe are not plotted. (Crown Copyright reserved.)

blockages so that cones built up against them, and these in turn swept over and outwards beyond the impediments. Since the three large cones north east of Invergloy were so formed,[8] one is forced to conclude that the older type of 'humpbacked' bridge or modern bridges provided with greater clearances would have been better suited to the abnormal conditions; and surely 'abnormalities' deserve consideration. Besides these cones there were only a few scattered patches of debris between Letterfinlay and South Laggan, particularly on stretches of road where torrents plunged over artificial cliffing to pass under the road and into the adjacent loch.

In Glen Nevis (Fig. 5) it was the lower part of the valley, below the waterfall (at 150 ft O.D.), which had been most affected by the flood damage. Behind Achriabhach, floodwaters had not only reworked portions of a low pre-existing fan but had also dispersed fresh detrital deposits over the area. At the time of examination, fine detritus to

the width of 150 ft still lay on or near the road, but the near-by wooden bridge over the burn had been spared destruction. The bridge possessed only a 4-ft clearance, and it can only be suggested that the spill-over of water from the fan apex had reduced the volume of water using the established channel, and so saved the bridge. On the left bank, between Achriabhach and Glen Nevis Youth Hostel, almost every site where a burn or drainage ditch crossed the road was marked by a small debris spread. These possessed only a nuisance value, being of insufficient size to cause much damage, and contrasted sharply with the numerous well developed debris cones on the opposite bank. It

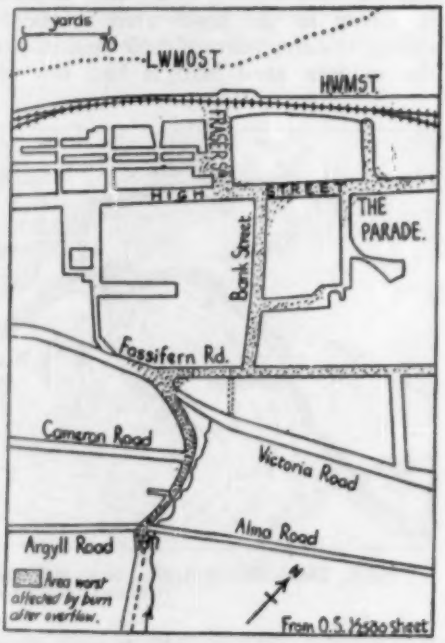


Fig. 9. Street plan of part of Fort William. (Crown Copyright reserved.)

was easy for the Nevis waters, possessing a low gradient and stretches of low banks, to rise and flood adjacent favourable areas. Evidence of this inundation remained in the form of flattened vegetation, fragments of transported vegetation and silt deposits, especially half a mile and two miles north of Polldubh.

Near by, at Fort William, a single stream had caused an amount of damage which seemed to be out of all proportion to its normal size and capacity (see Fig. 9). Its flow down through the town is normally regulated by a concrete pen, situated above Argyll Road, which also acted as a trap for loose vegetation debris. However, on May 25th a culvert below the concrete pen and the pen itself were incapable of dealing with the excessive amounts of water pouring into them and were soon bypassed as the water surged out onto and down adjacent roads. Through the efforts of the Local Authorities, the damaged area

was here restricted to that part of town about Fassifern Road, Bank Street, the Parade and adjacent property across the High Street, but a small part of the town to the south was also affected by running water. When the floodwaters subsided, 300 tons of debris were left strewn in the town—chiefly in the area indicated in Fig. 9—and of this, 260 tons were stones and gravel, whilst the remainder was in the form of silt. Such a bald statement in no way takes into account the damage suffered to property and furnishings, nor does it shed light on the amount of restoration work required to replace culverts, road surfaces and bottoming and to repair damaged property.[9] Whereas the main road south of Fort William was unaffected until east of Onich, the old Wade Road was severely scoured in several localities. The worst

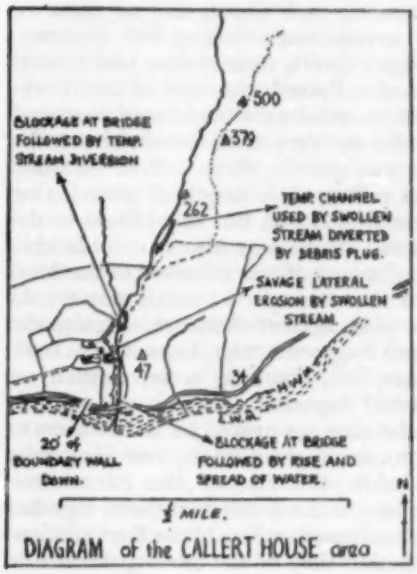


Fig. 10. Callert House area, Loch Leven. (Crown Copyright reserved.)

stretch began on the fringe of Fort William where the road climbed for about one mile to △ 487 ft, but the stretch of damage down a 1 in 7 slope, south of Blarmachfoldach, also deserves mention.

Along the north shore of Loch Leven (see Fig. 8) over 1000 tons of debris were removed after the storm. The bulk of this material lay in three debris cones which had been built up in torrent tracts and out over the road. In addition, three new 6 ft-span reinforced bridge culverts have now been installed to replace failures in the same section of the road. This type of culvert had withstood the floodwaters further north, but it was evident that they invited the formation of debris cones at their sites, where clearances were low.

Of these damaged areas, that at Callert was by far the most devastated, well deserving a more detailed account (see Fig. 10). Normally, the Callert burn, which flows down the south-east margin of Forestry

property into Loch Leven, is a youthful stream of modest proportions. At the time of high water, however, a debris blockage in its middle stretches caused a temporary stream diversion and the removal of considerable quantities of till from this now abandoned tract. The material in the blockage was of a coarse nature, containing boulders up to 6 ft×7 ft×4 ft size, and its site had the additional interest of being on an unplotted NW-SE fault line. Further downstream, and at the site of a nick point, the swollen stream had first piled rock and tree debris against a small bridge before bypassing this obstruction to plunge into its normal course again over an ephemeral, 20 ft high waterfall some distance away. Below this waterfall site there was ample indication that severe lateral stream erosion had occurred, especially near the east end of Callert House stables. Here, the greater part of a 13 ft wide minor road, running 15 ft above, and adjacent to, the stream had been removed by savage undercutting and scouring. Near the burn mouth, at the bridge culvert, finer debris had caused plugging, whilst coarser material had collected upstream of this blockage. Rising floodwaters laden with material were thus forced to spread at this site, and, since natural conditions were most favourable on the west bank, the resultant damage was greater there. Parts of stone boundary walls bounding the road collapsed, a length of stone facing under the road at the loch-side was ripped out, but in addition to the usual detrital material in the spread, there was also a considerable quantity of timber and vegetation. Indeed, it was a feature of the flood damage in the lower Callert burn that transported small tree trunks and branches formed considerable piles against obstacles. Again, the bark stripped from these transported fragments, together with the bark stripped from the trunks of larger, still standing trees, formed an effective addition to the finer detrital deposits.

To the east, at Kinlochleven, the damage caused by floodwaters to property was virtually negligible, but numbers of small, fresh landslides developed in the Eilde valley below the line of the Aluminium Company's conduit. It seems prudent to the writer that these, together with the several fresh slides near the surge-chambers of the Fort William works, should be watched to ensure that they do not develop and cause interference to installations.

Although it is not possible to indicate the amount of debris deposited along the south side of Loch Leven accurately, it is estimated that the total quantity dumped between Glens Chaolais and Coe must be comparable with that examined alongside Loch Lochy. Areas of heavy silting occurred near the mouths of the Laroch and Chaolais, which interfered with lines of transport, as did the two debris cones west of the Laroch valley. A new feature of the storm damage appeared half a mile south of West Laroch, where a small reservoir, sited on a left bank tributary, was completely choked by water-borne debris.

The area of silting on the Lower Laroch lay on the left bank between the new road and the older loop road (see Fig. 8), bounded by a scoured railway embankment on the outer side and a torn road surface near the bridge at West Laroch. Further up-valley the damaged reservoir was still unserviceable when visited, and, simply because of

the volume of debris it contained, seemed likely to remain so for some time to come. At the lower end of this reservoir the concrete retaining wall is 3 ft thick, 50 ft wide and 12 ft high, and behind it lay 70 ft length of infilling.[10]

Further west, the two debris cones developed where minor torrents, coming down the steep slopes south of the road, had their gradients checked. The cone about the Victoria plinth was 100 ft in length and 75 ft wide, but the adjacent one at the War Memorial was of slightly smaller dimensions. Fortunately, robust wire fencing had checked the spread of coarser detritus downhill, so that most of the deposits along the road were fine grained. Needless to say, the roadside culverts which normally served these torrents had been choked during the storm.

Adjacent to the grounds of the Ballachulish Hotel, the floodwaters of the Chaolais had caused the collapse of part of a high stone wall besides damaging the railings across the road to the north. Most of the Chaolais silting had taken place behind this stone wall, but smaller amounts were deposited north of it. Upstream, on the right bank, the silt was replaced first by rock trains and then by a boulder pile. From the disposition of the detrital deposits and the scoured or flattened vegetation, it was obvious that a temporary diversion, to the north-east, of some of the Chaolais water had occurred. This had been assisted by the situation of the boulder pile, which lay at the point where the normally shallow waters of the stream turned to flow north-north-west. As at Callert, mature trees bordering the stream had their roots exposed and then subjected to abrasion, but, as before, the roots had acted as 'binders' to prevent serious erosion.

South-west of Kentallen a T-shaped area of low ground is formed by the junction of a narrow SW-trending trough (glacially formed?) and Glen Duror. Factors which favoured inundation of part of the lower Duror valley were, firstly, high relief and steep slopes in the catchment area, and secondly, the near coincidence of the sites at which abrupt changes in the direction of flow, the valley form and the talweg gradient occurred. The haughland on both banks was affected from below Duror Inn to the A.828 road-bridge, where the character of the valley again changed. Silt and gravel deposits, together with odd fragments of vegetation, were scattered along this stretch, but only at Inshaig was part of the road affected.

North of Connel bridge the remaining areas seriously affected by the storm lay around Loch Creran, between Creagan and Dallachoilish opposite, and also in the lower Salach valley about Barcaldine. In the former, the physical conditions along the south side were similar to those described near Loch Lochy, except that some of the gullies and slides here had greater scope for cone development at the hill foot. As a result of more favourable conditions, too, the debris cones along the south side of Loch Creran were more numerous and of greater volume than on the north. Similarly, the only road bridge down owing to floodwaters lay near to Balliveolan (see Fig. 7). At the mouth of Gleann Dubh, near Barcaldine, the floodwaters had played havoc with the road surface, property walls and trees; then, to add to this destruction,

the waters, on subsiding, left the whole range of detrital deposits on the adjacent stream banks. Similarly, at Barcaldine the floodwaters damaged roads and railway track, road and rail bridges and forestry property further inland. As inspection of the map will show, the lines of the road and railway are again in close proximity, but in this area it was the road and the road bridges which acted as a buffer to debris-laden floodwater, and consequently these were most severely mauled.

Damage by floodwaters to roads and bridges on forestry land (see Fig. 1) was greatest in the North Argyllshire property. In all these, ripping up of stretches of road surfaces, and often bottoming, occurred, in contrast to the superficial damage in the north which resulted from culverts choking. Bailey bridges were affected, in varying degree, only in the Barcaldine and Duror areas, but in this latter area there was an additional complication, caused by the river being deflected by a debris blockage to flow through a plantation.

Numerous landslides over forestry land have not only involved the loss of considerable acreages of planted trees, but, together with gullies, have also damaged fences (deer and stock), drains and water gates. Though replanting will replace many of the tree losses, complete replacement will not be possible because of the appearance of new barren areas, where slides and gullies have exposed bedrock. Field evidence has shown that slides began either above planted areas which did not extend to heights above around 1200 ft, or else on slopes covered with young trees possessing only small root systems and low stature. (Only in the South Laggan forest were the trees affected older than the 6-12 years age group, but these, in the 20-30 years age group, were in check and of small size.) It was apparent, too, that because of tree impedance, the width of slide tracks and the growth of gullies was generally more restricted than comparable features on unprotected slopes. Despite this, the infilling of drains by detrital deposits was universal, although the amounts laid from forest to forest and within any one forest varied ; for example, in the Nevis forest 90 per cent. of the main drains were completely silted up.

Initially it may cause some surprise to read that in damage reports, kindly furnished by the North and West Conservators, particular stress should be laid upon the damage to fencing. Remembering, however, that planting is still going on each year, and that the oldest forest dates only from 1924, it will be appreciated that a great length of fencing is needed to protect young trees from rodents, stock and deer. Furthermore, the difficult and often rugged terrain must greatly increase the amount of labour required to instal, far less replace, this boundary fencing (see Summary). Finally, the lay-out of forestry rides as potential sources for slide and gully development deserves consideration. Since one set of these runs vertically up the hill-slopes, they must represent lines of weakness in the protective cover afforded by trees. The danger of accelerated rates of erosion down these rides should be considered, not only now, but in the light of what might occur when felled timber is being dragged away in several years' time. Would it inconvenience the forester to try out these long rides obliquely up hill-

slopes rather than vertically, for surely this new alignment would diminish some of the erosion risks?

The damage to existing roads and the interference to traffic which followed the storm were unavoidable because of existing conditions, natural and human, but probably of more importance now is the need to recognise that it will all happen again, in varying degree and from time to time. In Inverness-shire, the main road was reopened to one-way traffic on 25th May by 7 p.m. and to two-way traffic on the following Saturday. A week elapsed before the minor side roads were fully reopened, but permanent repairs to the roads were not completed until June 13th. South, in Argyllshire, the damage to major roads, for which government grants were applicable, amounted to over £94,000, whilst unclassified (minor) roads suffered an additional £36,000 worth of damage. The storm damage has therefore made considerable additional claims upon labour, time and money, and thus the future risk is by no means of academic interest only.

Although damaged portions of railway track were less frequent in occurrence than road blockages, they were sufficient to cause a temporary cessation of working west of Roy Bridge and a longer stoppage in Argyllshire, north of Barcaldine.

Interference to telephonic communications and electric transmission lines occurred because of electrical discharges during the storm, but the damage was not serious. In the former group, telephones were temporarily out of action, whilst in the latter group the overloading which took place merely tripped overload safety devices in installations belonging to the North of Scotland Electricity Board.

Thus it would appear that natural conditions within this part of Scotland favour the development of slope failure and the unfortunate deposition of debris where it is least wanted. The sandwiching of linear zones of potentially more useful ground between often flooded or damp valley floors and unfavourable steep valley slopes only serves to aggravate the situation. Forestry, in these glens, does offer the best aid to soil conservation and slope stability, besides making a most effective use of the land. Its role deserves to be greater, not only here, but elsewhere in Scotland where physical conditions are similar, provided that sanity prevails, the long view is taken and other claims on the land are fairly considered. Similarly in these areas, there is a real need for an appreciation of the physical background and a working knowledge of its processes.

Summary of Damage to Forestry Property

Fearnoch:—300 yards of road seriously affected. Damage by slides negligible. Two sections of fencing totalling half a mile need replacement.

Barcaldine:—One bridge washed away and the approaches to another damaged. Nine landslides in 1953 transplants with twenty acres of this plantation lost. Numerous losses to fencing, totalling well over 300 yards length.

Glen Duror:—200 yard infilling of debris in the former river channel

to be removed. Numerous landslides affected forestry roads. Four acres of 1953 and two acres of 1952 plantings disappeared and in places the older trees need rebrashing because of the amount of detritus deposited. Over thirty breaks in the 1952 and 1953 fencing. Numerous water-gates destroyed.

Glen Righ :—The largest new gully appeared on the fringe of this area at Callert, whilst twenty chains of fencing lost and thirty chains were damaged in the same area. For distribution of slides and cones, see Fig. 8.

Glen Nevis :—Fig. 5 shows distribution of new slides. The damage to roads was negligible, but the infilling of drains and the damage to fences was serious.

South Laggan :—Few new slides appeared in this forest and, like Glen Garry, it was not seriously affected by the storm.

This report has been prepared from material collected by the author during a short stay in the area, immediately after the storm. The author wishes to thank Professor A. G. Ogilvie and Professor R. Miller for their ready support and assistance during all stages of this work, the fieldwork expenses of which were met by a grant from Carnegie Funds. Again, but for the help and encouragement offered by various authorities and individuals this report would not have contained so much exact information as it now does. Gratefully the author wishes to acknowledge the part played by the Forestry Commission Conservators in Glasgow and Inverness ; the Forestry Commission (Maps Section), Edinburgh ; H.M. Meteorological Office, Edinburgh ; Mr Spaven, Department of Health, Edinburgh ; the Road and Burgh Surveyors (and the Outside Engineer, North of Scotland Electricity Board), Fort William ; and the Manager of the Kinlochleven Aluminium Works.

Photograph of Fort William, by courtesy of the Air Ministry, British Crown Copyright reserved.

[1] READ, H. H. The Grampian Highlands. [British Regional Geology.] Edinburgh : H.M. Stationery Office, 1948, pp. 1-4.

[2] LINTON, D. L. Problems of Scottish Scenery. *S.G.M.*, 1951, 67 (*2*) : 65-85.

[3] Rainfall figures were obtained from H.M. Meteorological Office, Edinburgh, and Daily Weather Reports for the 24th, 25th, and 26th May 1953 were used.

[4] The author saw only two probable examples of slow-moving creep on a large scale, and these occurred in Glen Nevis and Glen Roy. In the former, the site was on the lower left bank slopes where the Allt Coire a Mhusgain emerges into the main valley, whilst the latter site lay beyond Bohuntine, on the lower slopes of Bohuntine Hill. These features bore a strong resemblance to Cumberland's [5] " wrinkled hillsides " with slow downhill movement produced by subsod flowage.

[5] CUMBERLAND, K. B. Contrasting Morphology of Soil Erosion in New Zealand. *Geographical Review*, 1944, 34 : 77.

[6] WARD, W. H. The Stability of Natural Slopes. *Geographical Journal*, 1945, 105 : 170-191.

[7] GIFFARD, J. Landslides on Exmoor caused by the Storm of 15th August 1952. *Geography*, 1953, 38 (*1*) : 9-17.

[8] Their dimensions were measured, and they range in height from 6 to 15 ft, width from 50 to 75 ft, length 50 to 100 ft.

[9] It seems justifiable to comment briefly upon the town's susceptibility to flooding because of its situation. Not only do steep slopes rise behind the town, and the near-by high summits furnish snow meltwater to swell the run-off in an area of high precipitation, but exceptionally high spring tides can also threaten the lower-lying town property and sewerage.

[10] The estimated damage to the Ballachulish water supply amounted to £16,400 and to the Ballachulish drainage system, £1100.

Lower Glen Nevis. West bank, showing source of debris slide which developed on glacially smoothed metamorphic rocks. Marked scouring of glacial till has occurred and smaller trees in the line of the slide track have been uprooted and carried downhill.

East side of the Great Glen above Loch Lochy, about half a mile south of Letterfinlay Lodge. Gullying on the unprotected valley side. The damaged bridge acted as a buffer to the debris-laden flood-waters. The width of the slide track remains constant, apparently because of the uniform slopes.

Debris between Corriegour and South Laggan, the northernmost cone shown in text-figure 4. The pile of debris on the right is about 15 feet high. The formation of debris cones is aided by the low clearance of the modern type of culvert.

Fort William. Area affected by overflow of burn and shown in text-figure 9 is seen in centre of photograph.

RECONNAISSANCE VEGETATION SURVEY OF CERTAIN HILL GRAZINGS IN THE SOUTHERN UPLANDS

By Joy Tivy

In an attempt to assess the effect of physical factors on vegetation and land use in the Southern Uplands of Scotland, three sample areas of hill land, each covering approximately 100-120 square miles, were selected for detailed study. The position of these areas (Fig. 1) was decided mainly on climatic grounds, though the actual limits of each were influenced largely by considerations of accessibility. The necessity for recording observations about, and distributions of, the unimproved moorland vegetation in map form presented one of the major problems of this work. Efforts to resolve this problem have resulted in the compilation of preliminary reconnaissance vegetation maps of the hill grazings[1] of these three areas. Presenting that of the Newton Stewart area as an example (Fig. 2), it is proposed here to outline the methods and techniques employed in its construction and to consider, in general, the wider issues involved in the use of vegetation maps as a whole.

The idea of mapping groups of plants, sub-communities and associations, within the broad climatic climaxes of the world is neither original nor indeed a very recent one. By the end of the nineteenth century the concept of dynamic plant ecology had crystallised and was being applied by such workers as Warming in Denmark, Flahault in France, and later, Clements in America. It is not too much to say that these great botanists were geographically minded : they had to be. The associations they struggled to define reflected the dynamic nature of the habitats in which the plants grew—habitats defined by the inter-related factors of climate, soil, relief and human activities. Inspired by the teaching of Flahault, Robert Smith and Marcel Hardy applied these new techniques to the vegetation of Scotland. In 1906 Hardy [2] produced, on a scale of 1 : 633,600, a coloured vegetation map of the Highlands of Scotland. Between the years 1900 and 1912 ten primary map surveys of vegetation associations were compiled in the British Isles, and published in colour on scales of 1 : 126,720 and 1 : 63,360 by such workers as R. Smith [3] and W. G. Smith [4] in Scotland, and Rankin [5], Moss [6], and Lewis [7] in England, to mention but a few. These maps are excellent, based as they are on uniformity of symbol and technique. It must be regretted that such botanical surveys have been in abeyance since 1913, the nearest approach to them being the Grassland Survey of England and Wales [8] and the Land Utilisation Survey of Britain [9]. Modern plant ecologists have tended, with the development of their science, to concentrate on smaller and smaller plots in ever-increasing detail and to perfect experimental techniques. Such maps as have been produced are confined to localised areas and the scales and symbols used are dependent largely upon the authors' fancy.

The earlier workers have left very little indication of the techniques employed in their field work, but it can be assumed from Tansley that their primary surveys, aimed " at representing on a medium scale the

whole of the vegetation of a region", were preceded by, or were based on, wide reconnaissance surveys.[10] These permitted associations to be chosen which could be conveniently mapped. A series of line surveys followed, running parallel across a given area, along which the limits of the associations could be noted on a map. If the survey lines were drawn close enough together, boundaries could be joined up with reasonable accuracy. Most of the field mapping was done on a scale of 1 : 63,360, though Lewis, in his survey of the Eden, Tees, Wear, and Tyne Basins,[7] used 6 in. maps and supplemented his observations with prismatic compass and aneroid barometer readings. It took him three years to complete his field work.

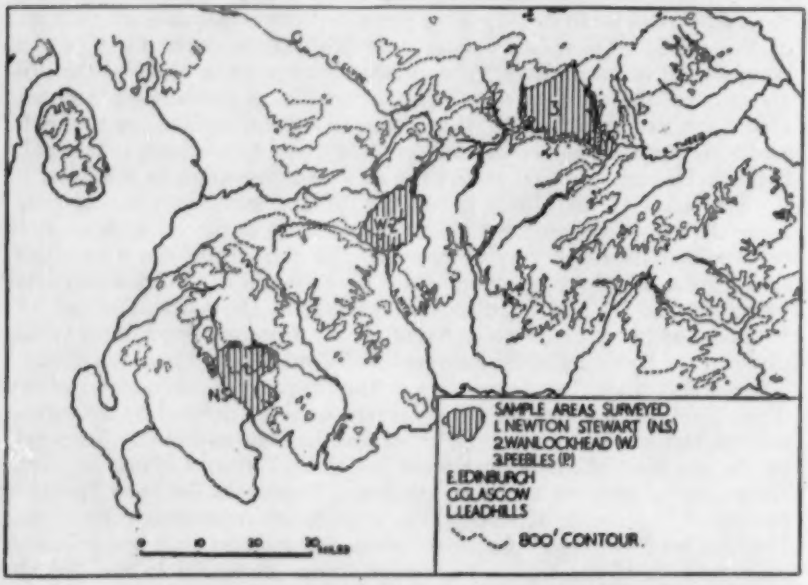


Fig. 1. Outline map of southern Scotland, showing position and extent of three areas surveyed.

In the case of the map presented here, the necessity for completing at least the first stage of the work within a reasonable period of time has dictated to a great extent the field techniques used. Reconnaissance and survey have had to be combined. Line traversing was abandoned. Instead, the area was broken down into a series of compartments usually comprising a burn and its watersheds, and each was covered on foot. Wherever a noticeable change occurred in the vegetation, an analysis was made of the main species and the position and extent of the particular association was noted as far as practicable on the map. It was unfortunate that most of the field mapping had to be done on a 1 : 63,360 scale, because at the time of the survey, 1 : 25,000 maps were available only for the Peebles area,[11] where there is little doubt that they allowed greater ease and accuracy of work. Over-ambitious attempts in the first few weeks to define systematically

the limits of associations by barometer and compass readings, and to measure slopes and to take soil samples within each association, had to be rejected in favour of purely observational methods. Time again set the limit, as well as the sheer physical effort of carrying an over-abundance of equipment. Also, it became quite clear that the place

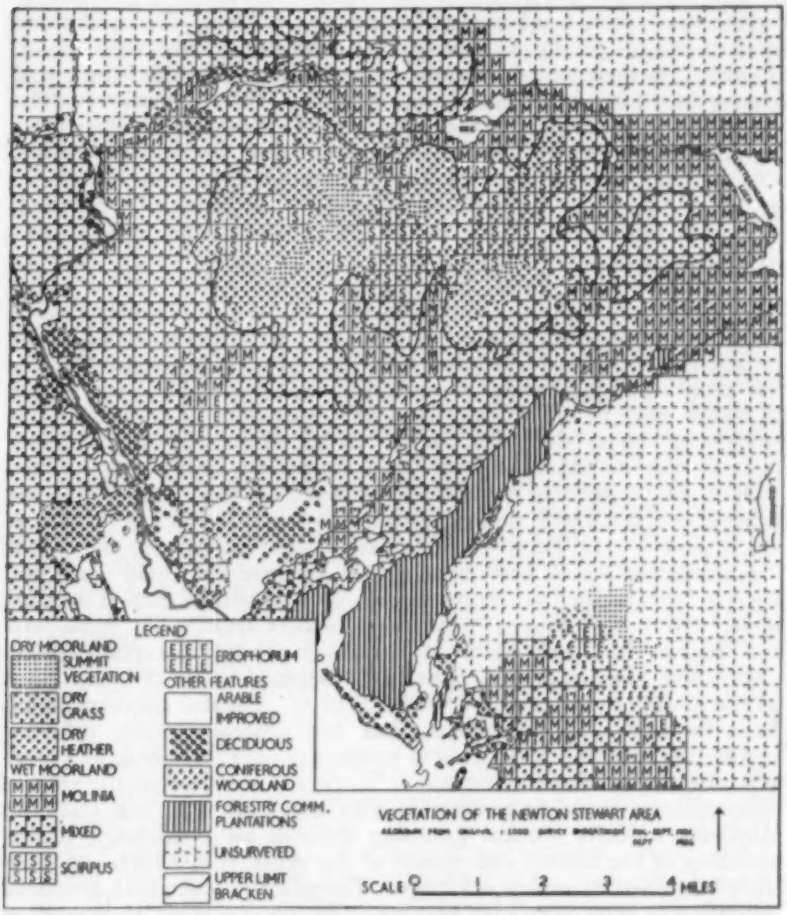


Fig. 2. Reconnaissance survey of the vegetation of the Newton Stewart area. (Crown Copyright reserved.)

for such systematic recordings was after a reconnaissance survey had been completed.

After several weeks in the field, the broad outlines of the main associations, their limits and their habitats, began to emerge from the at first seemingly inexplicable patchwork of vegetation resulting from the complex interrelation of physical causes, as well as from man's

activities of burning, draining and grazing, and also, in certain places, from his former cultivation. The next and most difficult stage of the work was the classification, definition, and delimitation of the associations which could be conveniently mapped on a 1 : 25,000 scale. The implications of this major problem require careful consideration.

The moorland vegetation of the Southern Uplands of Scotland is, for the most part, a sub-climax community, a biotic climax imposed by man and his grazing animals, rather than a true climax vegetation. It cannot, however, be too strongly emphasised that within the broad framework of this moorland formation there exist subdivisions of the vegetation whose differentiation and distribution arise from differences, regional and local, in landform (drainage and slope particularly), altitude, and climate. Marcel Hardy obviously appreciated this fact; in constructing his map of the Highlands of Scotland [8] he used, primarily, four main criteria in the delimitation of his associations: climate, geology, landform, and altitude. He was aware also, as were his contemporary workers, that within the broad associations which he defined there existed even smaller facets, innumerable intermingled 'facies' arising from local, as opposed to regional, variations in the principal physical and biotic factors. This did not, however, invalidate the attempts of these pioneer workers to construct a basic framework to which more detailed work could at a later date be related. They recognised the necessity for, as well as the limitations of, compiling primary vegetation surveys on small scales over wide areas. They tackled the problem of reconciling the results of their fieldwork to the exigencies of scale with courage, imagination, and integrity. It was no mean problem, as Tansley's lucid exposition reveals. He states that "communities which have been shown separately on field maps will have to be combined for representation on a published map of reduced scale. Seral and sub-seral phases and smaller areas which have been modified by man but which are obviously related to certain climax associations, will in general have to be included under the same head as the climax unless they are very extensive. Parallel climaxes which have no obviously different habitat and represent either different consociations of one association or sometimes parallel associations must often be treated in the same way. To decide exactly how the various communities should be grouped is often a difficult task, and ability to construct a really natural grouping depends on a thorough understanding of the history and nature of the vegetation, which can often only be gained by prolonged study. The effort to make such a natural grouping *is* very beneficial because it directs attention to important unsolved problems which further study may elucidate".[12]

In view of the size of the areas to be covered, the time at the author's disposal, and the scale of the topographic maps available, the classification of the associations finally decided upon for the Newton Stewart area is dependent mainly on the presence and combination of several dominant moorland species giving, especially in late summer and early autumn, a distinctive colouring to a particular association which can, in turn, generally be related to a particular physical habitat. The broken, dissected nature of this highly glaciated region made the task

of compilation difficult, and it was not until a second traverse of the area had been made that the particular classification used here was adopted.

In the definition of the associations which follow, only the main species will be quoted and the general characteristics of their habitats outlined. No attempt has been made to assess their actual status in terms of seral stages. In the course of the field work, observations often gave rise to interesting speculation as to the origin and destination of a particular association. It would be unwise to voice such speculations without the substantiation of prolonged and intensive observations and of experimental work, both of which are outside the scope of this study.

The associations indicated in Fig. 2 fall naturally into two main groups, of wet and dry moorland respectively.

I. *Dry Moorland:*

(*a*) Summit vegetation caps most of the hills above the 2000 ft contour line and is the nearest approach to an Arctic Alpine vegetation in the Southern Uplands. It forms a fine low-growing carpet of alpine sheep's fescue (*Festuca ovina* var. *viviparus*) and blaeberry (*Vaccinium myrtillus*), together with numerous mosses, lichens and sedges, growing on a layer of peaty soil seldom exceeding an inch in thickness. Its development in this particular area is limited, there being, with the exception of Cairnsmore and Merrick (outside the area surveyed), few hills with extensive summits over 2000 ft. Also its occurrence here at a relatively low altitude may reflect the severe exposure to which these hills, open to the west and south west, are exposed. This association contrasts in form, and in the autumn, in its darker green with

(*b*) Mixed Grass Heath or Moorland, 'the white hills' of the shepherd, dominated by such grasses as bents (*Agrostis* spp.), moor mat-grass (*Nardus stricta*), fine-leaved fescues (*F. ovina*, *F. rubra*), and sweet vernal grass (*Anthoxanthum odoratum*) as well as many other typical heath species. It reaches its widest extent and greatest dominance on steep (usually over 20°) smooth slopes—so common in the east and centre of the Southern Uplands, but atypical in this highly glaciated region—as for example the Larg, Lamachan and White Hills. The peaty soil is thicker than in the former association but is fibrous and well drained. Here, and in other local patches, this grassland may well be a sub-seral stage to

(*c*) Dry Heather Moorland with which, on occasions, it overlaps. This association, dominated by practically pure ling or heather (*Calluna vulgaris*) and so well developed over wide areas in the east, here only attains local dominance on steep well-drained slopes. Its place in the vegetation of the district will be considered in one of the wet moorland associations with which it must of necessity be grouped.

II. *Wet Moorland*, including both blanket and topogenous bog, is the most widespread community. Its associations appear to be determined largely by altitude.

(*a*) *Molinia* ' flow '[13] covers expanses of low-lying ground of negligible slope, particularly along the almost flat floors of the wide glaciated valleys or ' lanes ' of the Dee, Cooran, and Penkiln (Photograph 1). In its finest form this association is composed of large tussocks of purple moor-grass (*Molinia caerulea*) which at times assume dominance to the exclusion of all other species, on deep wet peat of mud-like consistency over which it is perilous to walk.

Purple moor-grass, a peat-forming plant, has a wide range of tolerance ; it is found in the succession to fen peat and carr, as well as towards acidic bog. It is, however, intolerant of completely stagnant conditions, and full dominance can only be attained where there is sufficient movement of water to allow a certain degree of aeration.[14] Along these glaciated ' lanes ', whose floors and lower slopes are often plastered with morainic material, there is considerable movement of water from the steep surrounding slopes towards the rivers and their flats and, probably, a considerable seasonal fluctuation of the water-table. Where, however, the river flats are very wide, as for instance along the Cooran Lane and around Loch Dee, there is a gradation from pure *Molinia* ' flow ' into what appears from a distance to be raised bog, on patches of ground isolated by the slight incision of the rivers and burns. This was not definitely established by close inspection, since such areas are too risky to visit without the assistance of a guide familiar with the ground.

Towards the edges of this pure *Molinia* ' flow ' association where increasing slope allows the movement of water down to river flats or into local hollows, bog myrtle (*Myrica gale*) appears and is often abundant, and eventually a bog myrtle - purple moor-grass association with a number of attendant species is established. The former species serves to define the bog myrtle - purple moor-grass association, which in this area is rarely found much above 850 ft. Other workers recognise it as a distinct association, but the scale of map used here does not make its subdivision from the *Molinia* flows practicable. In any case it occurs, broadly speaking, within the same physical habitat. It must, however, be pointed out that the bog myrtle - purple moor-grass association is also an ever present member of the vegetation outside the area indicated on the map as ' *Molinia* flow ' but, for various reasons which will be explained, is included in the most widespread of all associations.

(*b*) Mixed Wet Moorland. From a distance this association can be recognised primarily by its colour—the purple haze of the heather moor—which sets its contrast with the ' white hills ' on the one hand and the dark green of the ' *Molinia* flows ' on the other. It is, however, essentially a composite association containing diverse vegetation facies, and its classification and delimitation depend to as great an extent on a particular and characteristic type of land surface as on its specific content. The greater part of the Newton Stewart area presents an ice-scoured surface broken by steep scars, rocky knowes and a pronounced ridging. This is particularly evident to the north-west of the Bargaly Glen where the combined effects of

glacial and sub-aerial erosion of the steeply dipping, and often vertical, Ordovician strata have resulted in a deeply scoured surface (Photograph 2). Flats and hollows, across which burns meander sluggishly, alternate with sharp steep knowes and ridges through which the same burns cut miniature falls and defiles. This ridging, markedly Caledonian in trend, is preserved even on the sides and summits of hills of 1500 ft and over, particularly in the north-west of the area. Many of the burns, especially the right bank tributaries of the Bargaly Glen assume, if only on a local scale, a beautifully developed rectangular pattern. Also in the area directly south of the Trool-Minnoch Waters, ice disgorging from the Loch Trool rock basin has scoured part of a surface which falls gently from a break of slope at about 1000 ft—at the base of the ' white hills '—towards the north and north-west, to about 500 ft - 250 ft near the River Cree and Water of Minnoch. This is evidenced by a superb swarm of ' rock drumlins ' [18] on either banks of the Minnoch below its junction with the Trool. As the surface rises towards the base of the hills the individual ' drumlins ' lose their identity and merge gradually into a pattern of ridges and flats comparable to the Bargaly Glen area.

This extremely broken and ridged nature of the land surface is reflected in a minute compartmenting of the vegetation. Dry heather moorland and bracken or a mixture of ling, deer-sedge and purple moor-grass clothe the ridges and alternate with wet boggy flats. Below 850 ft, the flats carry the bog myrtle - purple moor-grass association already mentioned, unless as is so often the case the vegetation has been severely altered by grazing, burning or draining, when it is replaced by deer-sedge (*Scirpus caespitosus*), bog cotton (*Eriophorum* spp.) or a mixture of heather - deer-sedge - purple moor-grass. Above 850 ft, or even 750 ft, bog myrtle is absent, purple moor-grass loses its tussocky habit, and, unless the slopes are particularly steep, the vegetation is composed of a more even mixture of deer-sedge - heather - purple moor-grass. All these different ' facies ', intermingled and interwoven, reflecting so clearly local variations of the physical and biotic factors, are combined in this composite association called Wet Mixed Moor whose most constant and co-dominant members are heather, deer-sedge and purple moor-grass. It is so essentially a product of this particularly fragmented habitat that it would be impracticable and virtually impossible on this scale to attempt a classification or subdivision of this association on the basis of plant species alone. Over 1500 ft, purple moor-grass ceases to be an important member of the vegetation and

(*c*) *Scirpus* (deer-sedge) Moor,[22] reddish brown in late summer, becomes dominant on thick peat accompanied by heather, cross-leaved heath (*Erica tetralix*) and bog mosses (*Sphagnum* spp.), etc. It occurs locally on gently sloping ill-drained areas at the north western base of the ' white hills ' where deep peat has accumulated on a plugging of morainic debris. Here considerable hagging is in progress consequent upon the head-water erosion of the small burns which rise at the base and on lower slopes of the surrounding hills.

The association is, however, perhaps more characteristic and widespread at greater heights, and there, where the pronounced ridging of the lower ground remains evident over 1500 ft, *Scirpus* moor occupies gently inclined flats and alternates with dry grass or dry heather on upstanding ridges.

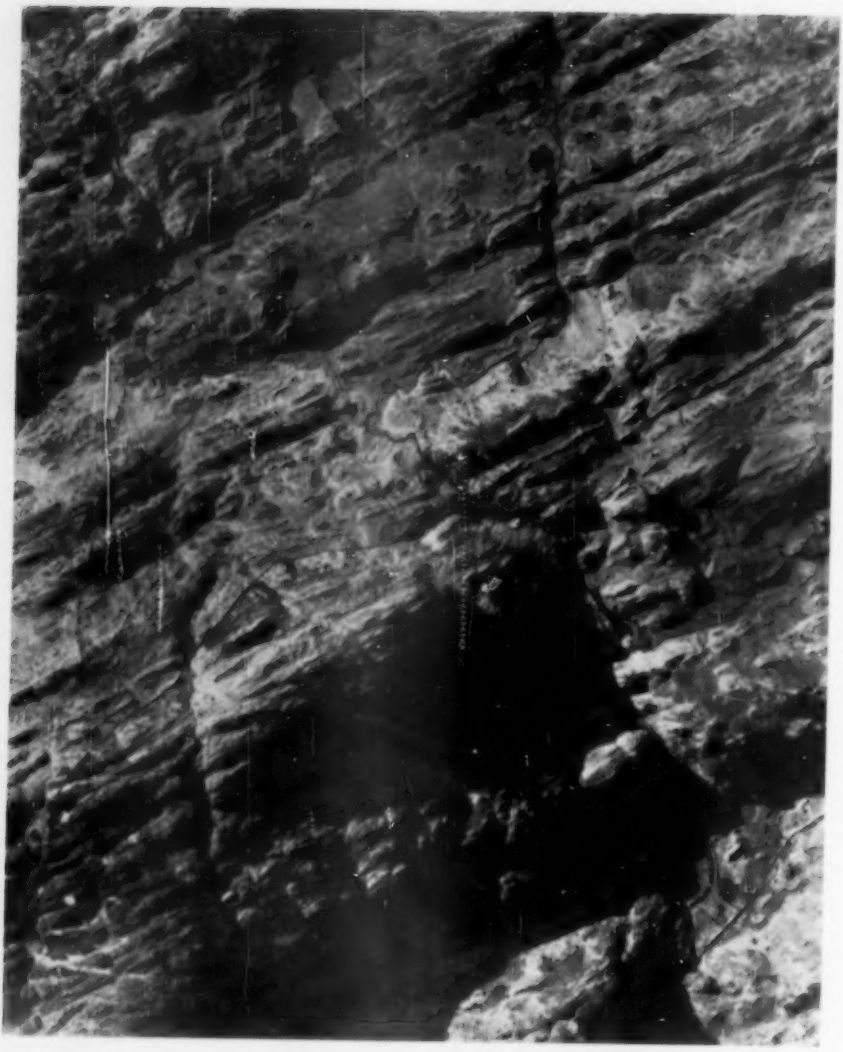
(*d*) *Eriophorum* (bog cotton),[23] in contrast to the eastern regions of the Southern Uplands surveyed, is here only of local occurrence. It was found as a dominant only on high level mosses (1750 ft-2000 ft) on Cairnsmore and in small patches among the previously mentioned associations.

It was at first intended to indicate bracken (*Pteridium aquilinum*) as a distinct association, but the ubiquitous nature of this plant would have caused considerable confusion on the map. It grows over so wide a range of associations and habitats, wherever a slight slope allows sufficient drainage and aeration, that, as Anderson [16] notes, it is not to be recommended as a suitable indicator of site. Hence an effort has been made to follow Stapledon's [17] suggestion and merely show the areas within which it occurs most profusely and its altitudinal limits.

The compilation of these associations on a 1 : 25,000 base map was undertaken with the assistance of the field map and notes, and vertical air photographs. Since, even at this scale, full detail cannot be shown precisely, some generalisation was necessary. In general, therefore, the habitat factors and altitudinal limits already mentioned were used to define the boundaries, except where field observations or air photos revealed striking divergencies. Abrupt and clear-cut changes from one association to another are relatively rare in this region. Where, however, severe burning or an abrupt change in gradient brings a heather or a *Molinia* dominated association in contact with dry grass, for example, the actual boundary *may* be quite sharply defined on the ground and in an air photograph. In nature, boundaries are seldom definite lines, rather are they zones of transition ; the boundaries on this map must, on the whole, be considered as such. The value of air photographs in such work is strictly limited, and they can only be used successfully to interpret moorland vegetation within an area which has first been surveyed on the ground.[18] Comparisons can be made between photographs of a known and an unknown area, but unless the time of year, hour of day, and visibility conditions are exactly similar, misleading conclusions can all too readily be drawn. In this case, air photographs were used to check the limits of cultivated and improved land, the extent of plantations and woodland and, only where possible, to verify the boundaries of the associations being mapped.

It was decided to produce the map in black and white to facilitate reproduction and, if necessary, reduction. That uniformity of symbol might be preserved over the three areas mapped, the excellent scheme suggested by Professor Salisbury—a scheme which as far as is known has not been widely used—for the representation of the vegetation of the British Isles in black and white was slightly modified and adopted.[19] He proposes (Fig. 3) basic symbols for woodland, dry and wet moorland, grassland, and arable, for use on scales of 1: 63,360 and less,

Loch Dee (25/470,790) surrounded by *Molinia* flow (white) giving way abruptly to mixed grass moorland with bracken (greyish). Change of gradient on slopes of White Hill (25/460,780) in south west corner of photograph.



Pronounced Caledonian ridging on highly inclined Ordovician strata north of Bargaly Glen, crossed by Grey Mare's Tail Burn, a small right-bank tributary of Palnure Burn. Grid reference 25/489,728 gives approximately the central point in the area covered by the air photograph.

together with a series of symbols which can be superimposed on them when a more detailed distribution is required on a larger scale. The symbols used here were chosen with a view to giving as clear as possible a contrast between one association and another, while at the same time allowing for the necessity of overlaps.

When the implications and significance of such a study for the geographer are considered, one may perhaps feel it rash for him to rush in where the wiser botanists have been reluctant to tread since 1913. However, if plant ecologists must be geographically minded, surely geographers should be, by their very training, ecologists in the

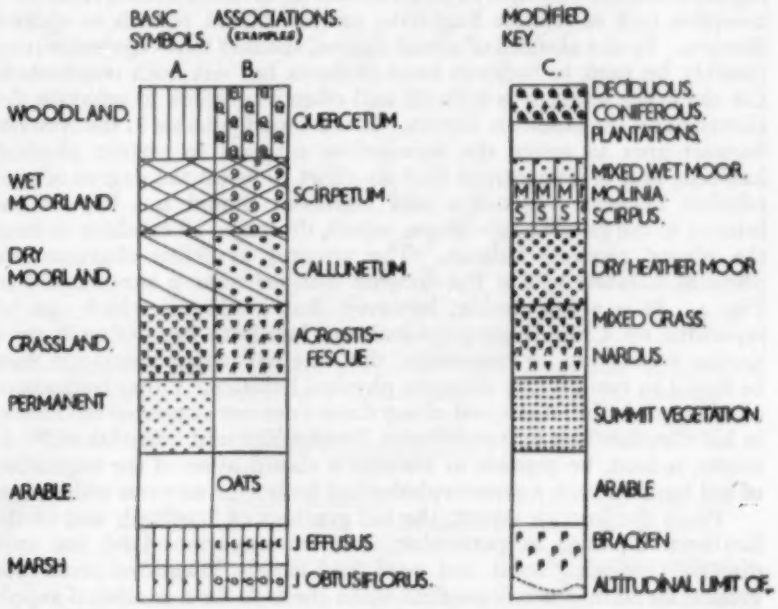


Fig. 3. Comparison of the symbols used for vegetation mapping (C) with those suggested by Professor Salisbury[19] for the representation in black and white of the vegetation of the British Isles; basic symbols for use on larger scales (A).

broadest sense of the word. The dominant plant species of our British hill-lands are relatively few and their recognition should present but little difficulty to the geographer—however slender his botanical knowledge—who takes the complexities of modern meteorology, geology and soil science in his stride. Certainly, much useful work is waiting to be done on the correlation of vegetation with climate and with landform.

For instance, a progressive change in the vegetation of the three selected areas, from north-east to south-west, would appear to reflect broadly the climatic differences between the wetter western and drier eastern parts of the Southern Uplands. To give but three general

illustrations : (1) *Molinia*, and in particular bog-myrtle, are common in the south-west. *Molinia*, without bog-myrtle, occurs in certain parts of the Wanlockhead area but neither species was ever found as a dominant in the Moorfoots. (2) On the other hand, bog cotton, the most usual dominant or co-dominant of the majority of upland mosses of the Moorfoots and the Wanlockhead area, was found only locally or as a sub-dominant in the area surveyed in Galloway. (3) Striking too was bracken, which under favourable edaphic conditions grew to a height and luxuriance in the south-west unsurpassed in the other two areas.

Detailed correlation between climate and vegetation within each region, however, is hampered by an almost (apart from rainfall records[20]) complete lack of reliable long-term meteorological records in upland districts. In the absence of actual figures, the fact that vegetation may possibly be used to indicate local climates has not been overlooked. On the other hand, it is difficult and often impossible to separate the climatic and the landform factors. It was found possible in the Newton Stewart area to assign the associations mapped to certain physical habitats, and it is suggested that an effort to assess the degree of correlation between vegetation and landform should not be without interest to the geographer—slope, aspect, drainage, all combine to form the plants' physical habitat. The attempt to define characteristic physical habitats within the Newton Stewart area is summarised in Fig. 4. It is worth noting, however, that landforms which can be separated on a purely geographical and landform basis often carry a similar association, or conversely, that one particular association may be found in two slightly different physical habitats. Other indications of what might be attempted along these lines are suggested by Linton in his classifications of landforms in Peeblesshire and Selkirkshire.[21] It might, indeed, be possible to attempt a classification of the vegetation of hill land on such a geomorphological basis over an even wider area.

From the human aspect, the hill grazings of Scotland, and of the Southern Uplands in particular, form an important land use unit, directly producing meat and wool and closely integrated with low-ground farms that are dependent upon the hills for a continual supply of Cheviot and Blackface breeding ewes which cannot be obtained elsewhere. Apart from reservoirs and grouse shootings, the only other major type of land use is that of forestry, the importance of which, on hill ground, has grown appreciably during the last fifty years. This is not the place to discuss the claims of the two interests, at the moment conflicting, of sheep farming and afforestation. The Balfour Committee reporting on Hill Sheep Farming in Scotland in 1944 was aware of the problems arising from this conflict of interest when it stated that, " in view of the importance which forestry is likely to assume in the future and the increased competition for land which will follow its development, it will be essential, in the interest of hill sheep farming and in the national interest alike, to control the allocation of hill lands to various uses ".[22]

Considering, then, that vegetation can be used to assess broadly the conditions on hill land,[23] that sheep are selective, and to a certain

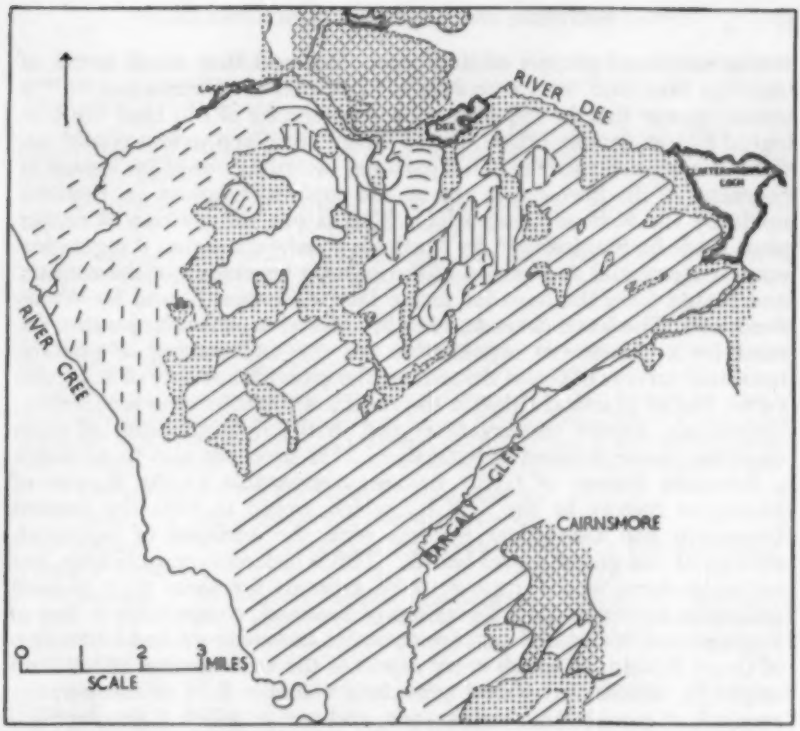


Fig. 4. Attempted classification of physical habitats which can be correlated with vegetation associations in the Newton Stewart area. Based upon the Ordnance Survey map, with the sanction of the Controller of H.M. Stationery Office. (Crown Copyright reserved.)

SYMBOLS	PHYSICAL HABITATS	VEGETATION ASSOCIATIONS
	Hills with steep (20°), usually smooth convex slopes, except where broken by cliffs, corries, or nivation hollows, over 1000 ft.	A. Dry grass moorland B. Dry heather moorland
	Similar to above generally, but slopes slightly ridged	C. Mixed dry grass and heather
	Steep (20°) convex slopes of Cairnsmore of Fleet granitic intrusion	D. Summit vegetation over 2000 ft
	Granite (part of Loch Doon complex) boulder-strewn lake-dotted upland : approximately 1250 ft	FACIES : Dry heather Wet Bracken mixed *Molinia*—bog myrtle moor *Juncus articulatus* Heather—*Scirpus* *Molinia* *Scirpus*
	Caledonian ridging of steeply dipping Ordovician strata : very pronounced below 1000 ft, but preserved up to 1500 ft	
	Rock drumlins trending NE-SW over a surface which slopes from 1000 ft to 500-250 ft	
	Ridging with marked N-S trend over 1500 ft	*Scirpus* with either dry grass or heather on steep slopes and ridges
	Spreads of morainic material usually flooring lower slopes of glaciated valleys	*Molinia* ' flows ' *Molinia*—bog myrtle *Scirpus*

extent rotational grazers of this vegetation, and that much stress, of late, has been laid on the ecological principles of afforestation,[24, 25] it would appear that in any allocation or planning of hill land the biological factors, among others, would have to be given serious consideration. A systematic survey of hill pastures, including one of the botanical character of the herbage, is among the recommendations for research made by the Balfour Committee. This is but a repetition of earlier pleas made by Stapledon [26], by Mathews [27], who states that " vegetation maps are essential as a record of the existing vegetation of the country and should form the basis for future land utilisation ", and by Wyllie Fenton.[28] The latter takes an even broader view, when he justifies the need for a permanent organisation for the undertaking of periodic botanical surveys of Great Britain, on the grounds not only of academic value, but of practical value in the choice of suitable areas for forestry, agriculture, nature conservancies and in the determination of areas requiring more detailed investigation. He proceeds also to advocate a Scientific Survey of Great Britain, comparable to the Bureau of Biological Survey in the U.S.A., which would include the present Ordnance and Geological Surveys with the addition of botanical, zoological and geographical bodies. This is indeed very ambitious, but certainly there would appear to be grounds for some type of land utilisation survey of the hill grazings of Scotland, comparable to that of England and Wales and complementary to the existing Land Utilisation of Great Britain, in which every aspect of the environment of hill land might be treated. It would provide a valuable field of co-operative research of considerable importance, and one to which a geographical approach and integration could, indeed, be profitably applied.

The author wishes to acknowledge with gratitude the advice and help of Professor A. G. Ogilvie, Professor S. J. Watson, and Dr E. Wyllie Fenton, who have supervised much of the work presented here. She is also indebted to Professor R. Miller, who read the original draft and made many useful suggestions concerning the presentation of the material.

Aerial photographs, by courtesy of the Air Ministry, British Crown Copyright reserved.

[1] Hill grazings : This term is used to indicate uncultivated, unenclosed land—as distinct from enclosed park-land—irrespective of altitude, which carries a semi-natural moorland vegetation, and which is used primarily for grazing and rearing hill sheep.

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[13] " Flow " is used to denote a morass or marshy area.

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DIAMOND JUBILEE OF THE GEOGRAPHICAL ASSOCIATION

During sixty years of activity, the Geographical Association has been vitally concerned with the evolution of geographical studies in Britain and with the development of education through geography. The capacity of the Association to thrive —there are now forty-four branches, including branches in Edinburgh and Glasgow —has been engendered and nurtured by a lucent galaxy of geographers, some of whom are portrayed in the Diamond Jubilee issue of *Geography*. The jubilee celebrations held in Sheffield on September 26th, 1953, are duly recorded, including the address by the immediate past president of the Association, Professor F. Debenham. The beginnings of the Association are described from the address by T. C. Warrington at the 1943 Jubilee Conference. Of special interest is a retrospect by Professor H. J. Fleure. A useful survey of the present position of geography in schools has been contributed by Dr O. J. R. Howarth.

The past activities of the Geographical Association have been felicitous, and adumbrate its further development and prosperity.

SAMOAN SURVEY

Although from time to time the physical resources and agriculture of Samoa have been briefly investigated, and several predominantly anthropological studies have been pursued, so far no thorough comprehensive and co-ordinated survey of the resources of the island group has been published upon which could be based the solution of a number of social, economic, and political problems arising from the transition from traditional subsistence to a modern commercial economy.

Some of the deficiences in up-to-date knowledge will be made good by the Auckland University College Department of Geography Samoan Survey, a research organisation directed by Professor Kenneth B. Cumberland, M.A., D.SC., and supported by a grant made by the Carnegie Social Science Research Grant Committee. The project, which will take at least five years to complete, will involve, among other things, a geographical field-survey of the resources, population, economy and contemporary land-use practices both indigenous and introduced. A detailed investigation will be made of some of the more important problems. The preliminary survey of the islands was started in December 1953.

REVIEWS OF BOOKS

EUROPE

British Caving : An Introduction to Speleology. Edited by C. H. D. CULLINGFORD. 9½×6. Pp. xvi+468. 87 figs. 48 plates. London : Routledge and Kegan Paul Ltd, 1953. 35*s.*

One might well begin by saying that in this book there is " a bit of something for everybody ". The title is not only truthful, but it is even an understatement of the wide range of aspects covered. The clear and adequately illustrated text is written by members of the Cave Research Group of Great Britain.

In the first four chapters, the reader is provided with the basic facts and theories on cave-forming rocks. Next come chapters on British caving regions and on caverns in mines, and a chapter—of special interest to the speleologist and technically minded—on cave physics. The remainder of the first part of the book is still concerned with our caves, but now the focus has changed : our attention is drawn to the part they have played as shelters, homes and burial places in the past, in fascinating contrast to the present occupation of the caves by fungi and animals. There is a separate chapter on cave bats. In the second part of the book, the reader is provided with a wealth of information on the practical side of caving. Besides clearly setting out the principles and precautions involved, this section also deals with cave diving and has useful material on cave surveying and photography.

Caves, mines and resurgences mentioned in the text are listed in one of the appendices, and there is also a list of some 65 British caving organisations, as well as a glossary of caving terms.

Treatment and scope are comprehensive throughout, illustrations are excellent, and the book most certainly fills one of the gaps in our general knowledge. R. C.

Orkney Farm-Names. By HUGH MARWICK. 8½×5½. Pp. viii+268. Kirkwall : W. R. Mackintosh, 1952. 21*s.*

Dr Marwick's investigations into the origins of farm-names in Orkney have formed a scholarly work of exceptional interest, which has occupied the author, with the help of friends, for many years : it was planned and begun in pre-war days. The work is divided into three parts, dealing with island and parish farm-names, scats and rents, and farm-name chronology. This book is the first attempt in Scotland to make such a survey of the farm-names of a county, and it is to be hoped that this lead from the north will be followed all the way to the south of Scotland, though such work must occupy many years. Few studies afford such profound glimpses into past history as the fascinating study of place-names. Dr Marwick's researches have added greatly to the historical knowledge of the early Norse settlements in the islands—with few exceptions, the old farm-names are Norse in origin. His book is a gold-mine of information, and it is safe to predict that it will become an Orkney classic. I. W. H.

The River Doon. By WILSON MACARTHUR. 8½×5½. Pp. x+112. 47 illustrations. Sketch map. London : Cassell and Co. Ltd, 1952. 15*s.*

This is a pleasant account of the Bonnie Doon and its valley—with various digressions—by an author whose books on the Rivers Windrush, Fowey, and Conway have been enjoyed by many readers. It is excellently illustrated with the author's photographs, and in addition to his own observations, contains much interesting material on local history. A. M. L.

From the Border Hills. By MOLLY CLAVERING. 8×5½. Pp. viii+275. 23 plates. End-paper map. Edinburgh : Thomas Nelson and Sons Ltd, 1953. 12*s* 6*d.*

Miss Clavering's vivid descriptions of delightful rambles on foot by Moffat Water, Yarrow and Ettrickdale, and in the upper reaches of the Tweed valley, will lure many to follow in her footsteps. She loves this beautiful region and has an intimate knowledge of it. Much out-of-the-way information, historical and otherwise, is imparted as she proceeds on her leisurely way, and the end-paper map enables the reader to follow her routes easily. The book is excellently illustrated. I. W. H.

The Domesday Geography of Eastern England. By H. C. DARBY. 9½×6. Pp. xiv+400. Frontispiece. 109 figs. Cambridge: University Press, 1952. 55*s*.

This great work by Professor Darby is the first of six volumes, designed to cover the whole of that part of England which was surveyed in 1086. The area covered in this first volume comprises the counties of Lincoln, Norfolk, Suffolk, Essex, Cambridge and Huntingdon. Although this area cuts across three historic regions, the county basis is a useful one comparable to the companion works of the Victoria County History and the Place-Names Society. With the aid of its excellent maps, this monumental study is essentially a cartographical and statistical analysis of a unique medieval 'geld book', the most comprehensive feudal survey of the land and its owners in medieval England.

Primarily the work is "the Geography of the Domesday Book". According to the limitations of its data, the hundred and nine maps drawn show the size of ploughland in each manor, its taxable value in terms of hides or carucates; its population and animal stock; its extent of pasture; meadowland and woodland; together with such miscellaneous data as the markets, mills, saltworks, and fisheries. As such, this work will be a source-book for historians containing more accurate statistical and cartographical material than Ellis and his successors have compiled. Professor Darby has used the statistical material most critically, fully aware of the inaccuracies, inconsistencies and lack of uniformity in the units of measurement and values. His work is thus the fulfilment of a dream shared , Stubbs, Maitland and Round for "a really true Domesday map".

To the geographer this work is more than a series of maps. It is the fullest description yet made of the landscape in eleventh-century England. The regional summary of each county and the general chapter on Eastern England whet his appetite for even more treatment. Reference is made in the text to that other great national survey, the modern Land Utilisation Survey of Britain. Together they provide the basis for yet more intensive studies in regional geography. J. M. H.

Farming in Finland. By W. R. MEAD. 8¼×5½. Pp. xvi+248. 57 figs. 8 plates. 41 tables. London: University of London, The Athlone Press, 1953. Distributed by Constable and Co. Ltd. 30*s*.

This is a book so thorough that it should be on the shelves of every official who has dealings with Northern Europe, of every University Department of Geography, and of every Agricultural College. The author has a first-hand acquaintance with Finland and obviously knows the Finnish language well. The physical frontiers of cultivation run across Finland. It has the uncertainty and restlessness of a political borderland; at the beginning of the last war it lost one-tenth of its surface area, but by 1947 most of the displaced farming communities had been anchored to new holdings. The lakes form an essential part of internal communications, by boat or sleigh; when neither is possible, the farmer is often marooned. The long working day in summer and the extended winter darkness are special conditions of the area: cattle must be stall-fed for eight months of the year. Grass is important and woodland even more so. The frontiers of wheat, barley and oats cultivation have been advanced by plant breeding—there are two main plant-breeding stations. The author stresses the happy liaison between agricultural research and geography in Finland. W. B.

Prospect of France. By ALAN HOUGHTON BRODRICK. 8¼×5½. Pp. 222. 31 illustrations. End-paper map. London: Hutchinson and Co. (Publishers) Ltd, 1952. 18*s*.

A book by a lover of France, who knows France thoroughly and who mixes praise with criticism. A mine of carefully acquired information on present-day France in its political, ecclesiastical, educational, literary, industrial, economic, architectural and many other aspects. It is not a guide-book in the usual sense, and deals in detail only with French Catalonia, but touching other parts from Paris southwards, in vivid sketches on a background of history. H. S.

Pyrenean Holiday. By REBE P. TAYLOR. 8½×5½. Pp. 224. 36 illustrations. Sketch maps. London: Robert Hale Ltd, 1952. 18*s.*

Intended to be an invitation to enjoy what the author and her companion experienced during a walking holiday from Andorra westwards through the Pyrenees to the Spanish Basque country, this book is somewhat disappointing. The Pyrenees are difficult to describe in view of their transitional features—French, half Spanish, and with the distinctive outlooks of Andorra and the Basque provinces. Explanations and personal experiences in the book tend to be prosaic, and the description of the magnificent scenery is not always satisfying. J. M. H.

In the Wake of Odysseus. By GÖRAN SCHILDT. Translated from the Swedish *I Odysseus Kölvatten* by Alan Blair. 8½×5½. Pp. 315. 14 illustrations. Sketch plan of Auxiliary Ketch *Daphne.* End-paper sketch map. London: Staples Press Ltd, 1953. 15*s.*

A delightful record of the author's voyaging in Grecian waters in his auxiliary ketch *Daphne.* Unlike many yachtsmen-writers, the author loves both the sea and the shore, and does not hesitate to make lengthy expeditions inland. His style is lively and full of charm, and he combines imagination with classical knowledge. Although seeking to write not of himself but of Greece, his personality pervades every page. *In the Wake of Odysseus* is certainly among the best books of its kind.

C. R. V. G.

ASIA

The Arabs and the West. By CLARE HOLLINGWORTH. 8×5¼. Pp. xii+286. 8 sketch maps. London: Methuen and Co. Ltd, 1952. 21*s.*

Miss Hollingworth is a shrewd observer and an active traveller, with over ten years' experience of the Middle East; and her book is a blend of high-quality journalistic *reportage* and serious study of contemporary events in their historical setting. Her views are forthright but generally sound, and the book is a significant contribution to the literature of the Middle East.

The author has shown ability, and also courage, in presenting a discussion of the circumstances surrounding the end of the British Mandate for Palestine, and the origin of the state of Israel. She makes clear that the whole episode reflects discredit on all parties concerned, and we in Britain could do well to ponder our record in this affair before ascribing all hatred and mistrust of this country among Arabs to mere wrong-headedness and xenophobia. Although events are presented largely from the historical and personal angle, there is at times an attempt to bring in environmental factors, with, as in one or two maps, a few signs of haste. W. B. F.

Afghanistan: A Study of Political Developments in Central and Southern Asia. By W. K. FRASER-TYTLER, K.B.E., C.M.G., M.C., ORDER OF ASTOR (AFGHAN). 8½×5½. Pp. xiv+348. 4 illustrations. 4 maps. London: Geoffrey Cumberlege, Oxford University Press. Second edition, 1953. 25*s.*

This book is essentially the personal memoir of one who has soldiered on the Northwest Frontier and who has held diplomatic office in Kabul. It can also claim some merit as an objective history of the country between the Indus and the Oxus.

The story begins in 500 B.C. Told in majestic prose, it becomes a pageant of invading peoples which rolls rhythmically by. From A.D. 1838 to 1907 the power politics of Britain and Russia are skilfully presented as a great game of chess. Thereafter the history throbs with the rich blood of personal experience. We are made aware of the importance of the fallible individual in the moulding of events. In this edition there is a new chapter which brings the survey to 1952 and wherein the Afghan irredentist dreams of a Pathanistan receive expert comment. In two chapters the author reflects upon the pattern of history of the Indian subcontinent and upon the effect of the physical environment. He makes stimulating suggestions, but one feels that he is merely projecting his own experience into all the other participants of the pageant. Historical facts do not submit graciously to military discipline.

There is a delightful description of the Afghan countryside, a lucid account of the tribal complexity and throughout a fine exposition of political and military strategy by one who, like Mackinder, is imbued with the forceful spirit of reality.

O. H.

AFRICA

Africa: A Study in Tropical Development. By L. Dudley Stamp. 9×5¾. Pp. viii+568. Illustrated. New York: John Wiley and Sons Inc. London: Chapman and Hall Ltd, 1953. 68*s*.

There has been a need in recent years for an up-to-date study, in English, of the African landscape in the broadest geographical sense, and of its society in a state of rapid, sometimes violent, change. Professor Stamp has written this new book to cater for such a want, especially in America, and incorporates many recent additions to our scientific knowledge of Africa. His aim has been an objective study of the continent, considering its geographical background as an environment for human activity, and the 'responses' which have been evoked from the 'African' inhabitants as well as more recent immigrants.

The first third of the book is devoted to general topics: historical development, physical geography, vegetation, peoples and ways of life, the plagues of Africa, and transportation. Giving as it does broad generalisations on an enormous subject, this section is inevitably somewhat uneven, but the final picture is remarkably clear, and there are some very valuable pages, for example in the first part of the chapter on soils. Regional studies fill the rest of the book, and Professor Stamp has been particularly successful in giving a clear impression, without excessive use of technical language, of the essential character of the great natural and political regions of Africa. More detailed description of a few native societies and their economic organisation might possibly have aided understanding of the effects of those violent cultural collisions which have become an essential feature of human geography in Africa; as it is, some unhappy anthropological generalisations do not add greatly to our understanding of native problems.

The text shows evidence of hasty preparation, and it is hoped that this will be corrected in a more reasonably priced British edition; economy could surely be effected by the elimination of many photographs which add little to the value of the book, but much to its cost.

By stressing the geographical nature of many of Africa's dilemmas, and the need for painstaking scientific study of many aspects, the author has made an important contribution to our appreciation of the former Dark Continent. A. MacP.

Moroccan Journal. By Rom Landau. 8½×5½. Pp. x+247. 27 illustrations. London: Robert Hale Ltd, 1952. 18*s*.

The author spends lengthy periods each year in Morocco and knows the country well. He treats but lightly of towns and villages, and concerns himself more with the habits of the people. He deals with the growth of Moorish nationalism in a sympathetic way, and at times criticises the French administration. Amongst other subjects dealt with are the complexity of the Moorish mind influenced by age-long customs, the different viewpoint of Berbers and Arabs, the remnants of paganism in Muslim religion, Moorish magic and sex relations. There is also a very interesting section on the history of Anglo-Moorish relations. One criticism: is there any need to have the Rabat diary, covering about a score of pages, printed in italics, not an easy type to read for long? The inclusion of a map would seem desirable. H. S.

Portrait of Tangier. By Rom Landau. 9×6. Pp. xviii+246. 38 illustrations. London: Robert Hale Ltd, 1952. 21*s*.

The fifth book on Morocco by the author, who knows and loves his subject. Though primarily dealing with the International Zone of Tangier, he brings in Moroccan history as a background. There is much information about the foreign communities in Tangier, and he is not afraid to criticise the French administration of the country. *Inter alia*, the decline of British prestige, the rise of the American, and the emergence of the nationalist movement mainly as a result of the native feeling of frustration at the hands of the French, are dealt with. The author had difficulties, not always surmounted, in penetrating official administrative barriers, but he has contrived to get behind the 'curtain' by various means; result, a book that fascinates. There is a bibliography and an adequate index. H. S.

The Nile: A General Account of the River and the Utilisation of Its Waters. By H. E. HURST, C.M.G., M.A., D.SC., F.INST.P. 8½×5½. Pp. xv+326. 27 figs. 33 plates. End-paper maps (1 : 9,000,000). London: Constable and Co. Ltd, 1952. 30*s*.

All who are interested in the economic, social, and political problems of the Nile Basin and in the hydrology of the river itself are deeply indebted to Dr Hurst, who for some forty years has been officially concerned with the collection, interpretation, and application of data anent the Nile and its behaviour, and has now presented a valuable general account distilled from his ripe experience.

After a very brief general survey of the Basin, the chapters of this important book deal with the Nile and irrigation in Egypt, the main Nile in the northern Sudan, the Blue Nile and Atbara, in the central Sudan and in Ethiopia, the White Nile and its tributaries, the country of the Great Lakes, and the Victoria Nile and Lake Victoria. There follow chapters on climate, health and vegetation, the early history of the Nile Basin and exploration in modern times. The remaining chapters—on the history of hydrological studies and the hydrology of the Nile Basin, and on present and future Nile projects—are of outstanding value. I. E. C.

AMERICA

Ravens and Prophets: An Account of Journeys in British Columbia, Alberta and Southern Alaska. By GEORGE WOODCOCK. 8½×5½. Pp. vi+244. 26 illustrations. 4 sketch maps. London: Allan Wingate Ltd, 1952. 15*s*.

Starting from their home at Sooke in Vancouver Island, the author and his wife travelled up the Fraser River to Prince George and thence to the Indian village of Kispiox, north of Hazelton. A second journey took them eastwards from Vancouver to Kootenay Lake, Macleod, and Calgary, and back via Banff and Kamloops. A voyage through the Inside Passage to Ketchikan in southern Alaska, returning overland from Prince Rupert, and another journey through southern British Columbia, to the Lower Arrow Lake, are also described in this commendable travel book. The portrayal of people and landscape is skilfully blended with local history, and also the author's observations on Indian, Dukhobor, Mennonite, and other individuals and communities provide interesting reading matter. J. H. K.

OCEANIA

Australian Setting. By GEORGE FARWELL. 8½×5½. Pp. 164. 17 illustrations. End-paper sketch map. [Windows on the World.] London: Evans Brothers Ltd, 1952. 12*s* 6*d*.

This is one of the best travel books the reviewer has encountered: it should be read by every one who seeks up-to-date knowledge of the island continent. The author has travelled widely in Australia and has engaged in an astonishing variety of occupations. He has a keen appreciation of things geographical and of the historical background of this new-old continent. The excellence of his seventeen photographs is exceeded only by the quality of his vivid narrative, which gives a clear and intimate picture of landscapes, cities, peoples and resources. The author guides us through New South Wales and Queensland, with a glance at the Great Barrier Reef; we learn about the hydro-electric and irrigation schemes of Victoria before crossing to Tasmania, with its "more home-loving people than the mainlanders"; recrossing to South Australia we journey over the Nullarbor Plain to Kalgoorlie and Perth; finally we cross the continent to Darwin by way of Alice Springs. E. V. L.

A Pattern of Islands. By ARTHUR GRIMBLE. 8½×5½. Pp. x+250. Illustrations and sketch map by Tom Pomfret. London: John Murray Ltd, 1952. 18*s*.

The islands of which Sir Arthur Grimble writes are the Gilberts, poorly endowed atolls astride the equator. The author describes in entertaining fashion his first years, 1914-1919, in the Colonial Service. The Gilbert Islands were then a British Protectorate of not more than just over twenty years' standing, and the appeal of this book lies in its dealing with a friendly 'unspoiled' people to whom European administration was still something of a novelty. C. R. V. G.

POLAR REGIONS

Greenland. Edited by KRISTJAN BURE. Translated by Reginald Spink. 8¼×5½. Pp. 167. Illustrated. Map. Copenhagen: Press Department of the Royal Danish Ministry for Foreign Affairs, 1952.

This beautifully illustrated hand-book on Greenland is a fitting companion volume to the book on Denmark [*S.G.M.*, 68 (*3*): 133] published by the Royal Danish Ministry for Foreign Affairs. In it experts write on the scenery, the Greenland Administration, the Greenlanders, their culture and daily life. There is an informative chapter on East Greenland by its former administrator Ejnar Mikkelsen, and the scientific exploration of Greenland is interestingly described by the botanist Gunnar Seidenfaden, who contributes some delightful flower photographs. The book should prove very valuable to all who are interested in Denmark's ice-bound colony, which is being drawn perhaps rather too rapidly into the stream of modern civilisation. I. W. H.

Our Alaskan Winter. By CONSTANCE and HARMON HELMERICKS. 8½×5½. Pp. 240. 25 illustrations. End-paper maps. London: Museum Press Ltd, 1953. 18*s*.

This is the third volume in an absorbing trilogy [see *S.G.M.*, 62 (*2*): 91; 66 (*2*): 124] by the adventurous Helmericks, describing their life amongst the Eskimo of Arctic Alaska, a region now being slowly opened up in consequence of the defence programme of the U.S.A. They camped and hunted on the Itkillik River and along the fringes and sand-spits of the Beaufort Sea, where the few white traders who once inhabited the area—such as old Tom Gordon, an exile from Glasgow—seem to have largely disappeared. It is sad to read of twenty-four seals shot—at the wrong season—and none retrieved, and the time has now come to preserve the polar bear and seals from mere shooting 'for sport'.

The book will enthrall the few who know Arctic Alaska, and will lure many others to explore it. I. W. H.

Seventh Continent: Saga of Australasian Exploration in Antarctica 1895-1950. By ARTHUR SCHOLES. 8½×5½. Pp. 226. 17 illustrations. 3 maps. London: George Allen and Unwin Ltd, 1953. 21*s*.

Australia and New Zealand have been intimately associated with Antarctic exploration in recent years, both with the use of their ports and supply of personnel. Now Mr Scholes has given us a book recording the share of these countries and written from their point of view. Thus many of the familiar stories of Antarctic exploration are omitted and less well-known ones are included. Bernacchi, Priestley, Mawson, Davis, and Rymill get most attention, but the list is a long one and tells of many adventures by land and sea. A large sector of Antarctica is now claimed by Australia, and the Ross Sea and its coasts have been claimed by New Zealand.

The book calls for little criticism. It is hardly correct to say that Rymill "maps Graham Land for the first time", or that Magellan rounded Cape Horn. The bibliography might have been more critical, and the index needs revision. But there is much good work in the book, and the sketch maps are useful. R. N. R. B.

METEOROLOGY AND CLIMATOLOGY

The Restless Atmosphere. By F. K. HARE. 7½×4¾. Pp. 192. 17 figs. London: Hutchinson's University Library, 1953. 8*s* 6*d*.

This book provides an excellent survey of the principal world climatic types, by examining the air masses and frontal systems that determine the day-to-day weather in each zone. The first eight of the fifteen chapters deal in lucid fashion with the theory necessary for analyses of this kind, i.e. with the fundamentals of dynamic climatology. After a short but quite adequate outline of the elementary physics of the atmosphere, there follow accounts of airmass analysis, depressions, anticyclones and the general circulation of the atmosphere. The treatment is always from the point of view of the geographer. The purpose of the book, the analyses of regional climates, is fulfilled in the remaining chapters; the regions treated in detail are,

according to the author, " those usually covered by university courses in regional geography for honours students in Britain and North America ".

This modestly priced book is certain to be widely and profitably used by students for many years to come. J. P.

Weather Inference for Beginners. By D. J. HOLLAND, M.A. 10×7¼. Pp. xiv+196. Frontispiece. 50 figs. Cambridge : University Press, 1953. 30*s.*

The expressed purpose of this book is to " illustrate the analysis and forecasting of weather with local observations and charts from the Meteorological Office ". The information concerning air masses, fronts, clouds, and codes deemed necessary to enable the reader to make a first examination of a series of weather observations is compressed within the first twenty pages. Sets of observations made in the London area during 1936 are then given in chronological order and the relation of each to the synoptic situation examined. Every now and then an example crops up that enables the author to introduce a fresh snippet of theory, and there are chapters on thermodynamics and hydrodynamics in which occasional use is made of the calculus and vector notation.

While one cannot but admire the industry, enthusiasm, and ingenuity of the author, the inference, which is most plain is that this method of making theory follow example has resulted in a hotchpotch of illogical development that must repel even the reader with some meteorological knowledge, let alone the general reader to whom the book is addressed. J. P.

The Climates of the Continents. By W. G. KENDREW. 9½×5½. Pp. 607. 194 figs. Oxford : Clarendon Press. Fourth edition, 1953. 50*s.*

The mass of new climatic data that has accrued, mainly through the extension of air operations both during and after the war, has made necessary the preparation of a new edition of this well-known book. Reviews of the three previous editions appeared in the *S.G.M.*, 39 (3) : 210, 44 (3) : 187, and 53 (3) : 228. Such has been the increase in the number of sources of information that the author is led to comment in his preface that " for the first edition of this book, the difficulty was to find any precise information about many parts of the earth, but now the problem is rather to select judiciously and compress into the available space ". Dr Kendrew has re-written many parts of the text and has made additions ; he has selected for more detailed description " regions of significance in the world's present turmoil or likely to be prominent in the future ". The fourth edition, then, is virtually a new book, containing revised climatic means and many new data. J. P.

[BIOGEOGRAPHY

Under the Sea-wind : A Naturalist's Picture of Ocean Life. By RACHEL L. CARSON. 8½×5½. Pp. 239. Illustrated by C. F. Tunnicliffe. London : Staples Press Ltd, 1952. 12*s* 6*d.*

The author of that fascinating book *The Sea Around Us* [see *S.G.M.*, 68 (1) : 43], which is as sound science as it is fine literature, has given us another volume about the sea. This time it is an account of the surge of life above and below the waters of the western Atlantic, which entails the life histories of many birds, fish, and more lowly animals. Scientific accuracy and dignity of prose are combined with unusual skill. R. N. R. B.

The Lost Woods : Adventures of a Naturalist. By EDWIN WAY TEALE. 9×6. Pp. 224. 34 illustrations. London : Robert Hale Ltd, 1952. 21*s.*

Mr Teale is a wandering naturalist to whom nothing in the plant or animal world comes amiss. His wanderings have been confined to the United States from Maine to Florida and west to California, so he gives his readers a description of every type of scenery and life that the United States has to offer. Particularly interesting are his visits to Thoreau's Walden and, secondly, his account of the habits of kingcrabs. The book never lacks interest, and the pictures are original and striking. R. N. R. B.

EDUCATIONAL

The Earth and Its Mysteries. By G. W. TYRRELL, D.SC., A.R.C.S., F.G.S., F.R.S.E. 7½×5. Pp. xii+278. 54 figs. 15 plates. London: G. Bell and Sons Ltd, 1953. 16*s*.

This is an admirable book, most lucidly written, with well-chosen illustrations. Experts are not always able clearly to condense a mass of knowledge and, without sacrificing essential facts, to make an easily read and popular book, but Dr Tyrrell has succeeded with his fascinating account of the structure of the earth on which we live. Although he modestly hopes that his book will prove "useful to elementary students of geology"—as it undoubtedly will—it can also be quite fairly affirmed that it can be read with profit by any geologist, as Dr Tyrrell has not hesitated to set forth many of the more debatable problems and to clarify the issues involved. The reader is thus assisted in forming his own conclusions from the impartial account of an authority whose high reputation is known beyond the confines of his own country. Scotland is the home of geology, and the author has chosen many Scottish rock exposures to illustrate this comprehensive and lucid history of the earth.

G. M.

Physical Geography. By PHILIP LAKE. Revised and enlarged by J. A. Steers, G. Manley, and W. V. Lewis. Edited by J. A. STEERS. 8½×5½. Pp. xxviii+424. 210 figs. 24 plates. 7 maps. Cambridge: University Press. Third edition, 1952. 17*s* 6*d*.

Apart from some minor corrections, a welcome new feature of the third edition of this well-established text-book [see *S.G.M.*, 31 : 223 ; 66 : 184-185] is the addition of a brief chapter on River Régimes.

J. H. K.

GENERAL

Geographische Grundlagen der Geschichte. By HUGO HASSINGER. 9×5¾. Pp. xii+392. 11 maps. [Geschichte führender Völker.] Freiburg im Breisgau: Herder und Co. G.m.b.H. Second edition, 1953. *DM* 22.

Since publication of Friedrich Ratzel's treatises, no survey of geographical data n their bearing upon human history and culture has been more widely acclaimed in German-speaking countries than Professor Hassinger's volume (1931) in the series entitled the "History of Leading Nations" [see *S.G.M.*, 1932, 48 (*1*) : 55]. The author died shortly after the second edition had gone to press in 1952 ; the extensive bibliography and index were completed by his son. The work has been considerably revised and brought up to date, and information on trans-oceanic migrations and on northern, central, and eastern Europe has been extended. The new edition is of interest to both the geographer and the historian.

J. H. K.

The Tropical World: Its Social and Economic Conditions and Its Future State. By PIERRE GOUROU. Translated by E. D. Laborde. 8½×5½. Pp. xii+156. 16 figs. 39 photographs. [Geographies for Advanced Studies.] London: Longmans, Green and Co. Ltd, 1953. 18*s*.

This book contains a vast amount of thought concerning the hot, wet regions of the globe. The author is Professor at the Collège de France and at the Free University of Brussels. Having resided in Indo-China and visited parts of tropical Africa and South America, his outlook is different from that of one mainly acquainted with the British Commonwealth. India is slightly dealt with, though the facts are up to date and accurate. To the ordinary reader it comes as a surprise to learn that tropical lands are, as a rule, thinly populated, have poor soils and timber of low value. Better known are the facts that human disease is prevalent and that stock-rearing is at a disadvantage. The author lays too much emphasis on shifting cultivation, but is correct in his estimate of the part played by rice as a basis for flourishing civilisations ; he makes the point that rice cultivation does not exhaust the soil. The author is against terraced rice cultivation—as wasteful of labour—and advocates the utilisation of whole areas—so that conquest of disease may keep pace with control of nature. He trusts a narrow nationalism will not prevent the tropics playing their natural part—which is *not* that of industrialised areas.

W. B.

A Voyage round the World with Captain James Cook in H.M.S. 'Resolution'. By ANDERS SPARRMAN. Translated by Huldine Beamish and Averil Mackenzie-Grieve. Introduction and Notes by Owen Rutter. 8½×5½. Pp. xx+214. Illustrations by C. W. Bacon, N.R.D., M.S.I.A. Chart. London: Robert Hale Ltd, 1953. 21*s.*

A Voyage round the World presents a record of Cook's search for the supposed Great Southern Continent in the *Resolution*, 1772-1775, written by a Swedish botanist who joined the expedition at Cape Town. It is largely built up from notes which Sparrman must have made at the time, although the book was not written until many years later. The original work was in Swedish and published in two parts, in 1802 and 1818. It lay almost forgotten until translated into English for the Golden Cockerel Press, which produced a limited edition ten years ago. The present is the first general edition.

A 'new' account of one of Captain Cook's voyages written by a companion of the great navigator cannot fail to be full of interest. Sparrman's style is simple and entertaining. His narrative benefits from having been written in later years, since this has enabled him to embody information derived from the subsequent expeditions of La Pérouse, Bougainville, and Vancouver. C. R. V. G.

They Came to the Hills. By CLAIRE ELIANE ENGEL. 8½×5½. Pp. 275. 17 illustrations. London: George Allen and Unwin Ltd, 1952. 21*s.*

The author of *A History of Mountaineering in the Alps* [see *S.G.M.*, 67 (2): 129] has given us another charming book on climbing. It has taken the form of short biographies of the leading mountaineers of the last hundred to a hundred and fifty years. What were the motives that drove men to this strenuous work? Miss Engel tries to answer this question and gives us vivid pictures of men of world-wide fame for their pioneering work, from J. D. Forbes and J. Tyndall to Mallory and Smythe. A brightly written book of wide interest. There is an extensive bibliography. R. N. R. B.

PUBLICATIONS RECEIVED

EUROPE

Types of Farming in Scotland. By the Staff of the FARM ECONOMICS BRANCH OF THE DEPARTMENT OF AGRICULTURE FOR SCOTLAND. 9½×6. Pp. 101. 24 maps. 63 tables. Edinburgh: H.M. Stationery Office, 1952. 3*s.* 6*d.*

Ninety-Seventh Annual Report of the Registrar-General for Scotland, 1951. 9½×6. Pp. 430. 2 maps. Edinburgh: H.M. Stationery Office, 1953. 11*s.*

Resources and Prospects of the Isle of Lewis and Harris. By ARTHUR GEDDES. 7×4¾. Pp. 98. Reprinted from the *Stornoway Gazette*, by arrangement with the Outlook Tower Association, Edinburgh, 1952.

The City of Aberdeen. By HUGH MACKENZIE, D.S.O., M.A. Introduction by Professor Henry Hamilton. 9×5¾. Pp. xvii+599. 20 figs. 8 plates. Map (1: 25,000). [The Third Statistical Account of Scotland.] Edinburgh and London: Oliver and Boyd Ltd, 1953. 20*s.*

An Inventory of the Ancient and Historical Monuments of the City of Edinburgh, with the Thirteenth Report of the Commission. THE ROYAL COMMISSION ON THE ANCIENT MONUMENTS OF SCOTLAND. 11×8½. Pp. lxxviii+289. 431 figs. Edinburgh: H.M. Stationery Office, 1951. 45*s.*

Edinburgh University Calendar 1953-1954. 8½×5½. Pp. xiv+773. Edinburgh: Published for the University by James Thin, 1953. 12*s* 6*d.*

Old Edinburgh Taverns. By MARIE W. STUART. 8½×5½. Pp. 191. 9 illustrations. London: Robert Hale Ltd, 1952. 12*s* 6*d.*

Census of Woodlands 1947-49—English County Details: Woods of Five Acres and Over. 13×8. Pp. vi+270. [Forestry Commission Census Report No. 5.] London: H.M. Stationery Office, 1953. 12*s* 6*d.*

British Regional Geology: Northern England. By T. EASTWOOD, A.R.C.S. With some Additions by F. M. TROTTER, D.SC., and W. ANDERSON, M.SC. 9½×6. Pp. vi+72 26 figs. 8 plates. [Geological Survey and Museum.] London: H.M. Stationery Office. Third edition, 1953. 4*s.*

ASIA

The Road to Oxiana. By ROBERT BYRON. Introduction by D. Talbot Rice. 8½×5½. Pp. 292. 13 illustrations. End-paper sketch maps. [Library of Art and Travel.] London : John Lehmann Ltd, 1950. 15*s.*

The Hard Way to India. By JOHN SEYMOUR. 8½×5½. Pp. 205. 42 illustrations. Decorative end-paper sketch map, by William Seymour. London : Eyre and Spottiswoode Ltd, 1951. 16*s.*

New Zealanders and Everest. By L. V. BRYANT. Foreword by Sir Edmund Hillary. 8½×5½. Pp. 48. 21 illustrations. Sketch map. Wellington, N.Z. : A. H. and A. W. Reed, 1953.

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South China in the Sixteenth Century : Being the Narratives of Galeote Pereira, Fr. Gaspar da Cruz, O.P. Fr. Martin de Rada, O.E.S.A. (1550-1575). Edited by C. R. BOXER. 8½×5½. Pp. xci+388. 12 illustrations. 8 sketch maps. [Works issued by the Hakluyt Society, Second Series, No. CVI.] London : Printed for the Hakluyt Society, 1953.

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Die Sahara und die Syrtenländer : Gegenwart, Vergangenheit und Zukunft der grössten Wüste der Erde. By HEINRICH SCHIFFERS. 7⅞×5½. Pp. 254. 70 figs. 27 photographs. 7 maps. [Kleine Länderkunden.] Stuttgart : Franckh'sche Verlagshandlung, 1950. *DM* 10.80.

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Zimbabwe Cavalcade : Rhodesia's Romance. By B. G. PAVER. 8½×5½. Pp. viii+164. 6 illustrations. Sketches and end-paper sketch maps by Ursula Garrett Paver. Johannesburg : Central News Agency Ltd, 1950. 15*s.*

The Bantu Tribes of South Africa. Photographs by A. M. DUGGAN-CRONIN. Vol. 3, Section 2. The Nguni. The Mpondo and Mpondomise. Introduction and descriptive notes by MONICA WILSON, M.A., PH.D. 11½×8½. Pp. 19. Plates 41-80. Kimberley : Alexander McGregor Memorial Museum. Cambridge : Deighton, Bell and Co. Ltd, 1949. 25*s.*

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Here are Diamonds. By ERIC ROSENTHAL. 8½×5½. Pp. 280. 17 illustrations. London : Robert Hale Ltd, 1950. 15*s.*

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EDUCATIONAL

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A Sketch-Map Geography: A Text-Book of World and Regional Geography for the Middle and Upper School. By E. G. R. TAYLOR, D.SC., and E. M. J. CAMPBELL, M.A. 8½×6½. Pp. viii+164. 165 figs. London: Methuen and Co. Ltd. Revised edition, 1950. 6s.

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Mémoires et Documents. CENTRE DE DOCUMENTATION CARTOGRAPHIQUE ET GÉOGRAPHIQUE. 10½×8½. Tome II. Pp. 301. Illustrated. Tome III. Pp. 242. Illustrated. Paris : Centre National de la Recherche Scientifique ; Institut de Géographie de l'Un' ersité de Paris, 1952. 4200 *fr.* per volume.

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A Dictionary of Scientific Terms : Pronunciation, Derivation, and Definition of Terms in Biology, Botany, Zoology, Anatomy, Cytology, Genetics, Embryology, Physiology. By I. F. HENDERSON, M.A., and W. D. HENDERSON, M.A., B.SC., PH.D., F.R.S.E. Fifth Edition by JOHN H. KENNETH, M.A., PH.D., F.R.S.E. 8½×5½. Pp. xvi+506. Edinburgh and London : Oliver and Boyd Ltd, 1953. 32*s.*

Mandeville's Travels. Texts and Translations by MALCOLM LETTS, F.S.A. 8½×5½. Vol. I. Pp. lix+1-223. Frontispiece. 2 maps. Vol. II. Pp. xii+226-554. 3 illustrations. [Works issued by the Hakluyt Society, Second Series, Nos. CI and CII.] London, 1953.

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Simple Heraldry. By IAIN MONCREIFFE OF EASTER MONCREIFFE, O.ST.J., M.A., LL.B., F.S.A.SCOT., and DON POTTINGER, M.A., D.A. 9½×7½. Pp. 64. Coloured illustrations. Edinburgh : Thomas Nelson and Sons Ltd, 1953. 10*s.* 6*d.*

INTERNATIONAL CONFERENCE OF TEACHERS OF GEOGRAPHY

Organised by the Geografische Vereniging in the Netherlands on behalf of the International Union of Associations of Teachers of Geography, the Second International Conference of Teachers of Geography will be held at Drakenburgh, Hilversum, from Monday, August 23rd, to Saturday, 28th, 1954.

The Conference will be opened by the President, Dr W. J. Jong, at 10.30 a.m. The programme includes lectures, group discussions, and two all-day and two afternoon excursions. A social evening is planned for August 27th, and the closing session will be held after lunch on the following day.

The charge for the period of the Conference will be fl. 85 (£8 10*s.*), inclusive of board and residence, gratuities, excursion fees, etc.

Applications and requests for information should be addressed to Professor Dr A. C. de Vooys, Drift 21, Utrecht, Netherlands.

ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

PROCEEDINGS

MEETINGS OF COUNCIL were held on 19th January and 9th March 1954.

AWARDS: The Diploma of Fellowship was awarded to D. ALAN STEVENSON M.I.C.E., F.R.S.E., and D. G. MOIR.

OBITUARY

The Council recorded with deep regret, the deaths of Captain ANGUS BUCHANAN, M.C., F.R.S.G.S., and Professor ALAN GRANT OGILVIE, O.B.E., M.A., B.SC., F.R.S.E., F.R.S.G.S., Vice-Presidents of the Society.

LECTURE SESSION, 1953-1954

The following lectures were delivered:

EDINBURGH. *Usher Hall.*—Mr JAMES FISHER, M.A., on "The Fulmar" December 17th. Professor W. Q. KENNEDY, F.R.S., on "The Mountains of the Moon" January 21st. Mr HEINRICH HARRER, on "Seven Years in Tibet" February 10th. Dr J. V. HARRISON, M.A., on "The High Andes" February 18th. Dr F. FRASER DARLING, F.R.S.E., on "Alaska To-day" March 18th. *Central Hall.*—Mr H. A. MOISLEY, B.SC., M.SC., on "The Fascination of Norway" December 2nd. Miss JOY TIVY, B.A., B.SC., on "The Personality of Ireland" December 9th. Mr TOM WEIR, on "The Scottish Nepal Expedition, 1952" January 13th. Dr PETER DAVIS, B.C., on "Central and North Eastern Turkey" January 27th. Captain J. NOEL PHILLIPPS, M.C., F.R.G.S., M.INST.T., on "35,000 Miles by Land and Sea through India, Ceylon, Australia, New Zealand, and South Africa" February 10th. Professor A. J. BEATTIE, M.A., on "Sparta To-day" February 24th. Mr J. C. BARTHOLOMEW, M.A., on "The Eastern United States—Some Impressions" March 10th. *The Society's Rooms.*—[New Developments in Geography.] Dr W. A. FAIRBAIRN, on "The Significance of Forestry in the Colonies" December 3rd. Dr S. F. COLLINS, M.A., on "Environment and Social Changes in the West Indies" January 14th. Dr H. FAIRHURST, on "Health and Nutrition in the Tropics" February 4th. *Synod Hall.*—Film Show for Young People, December 26th.

GLASGOW. *Grand (St Andrew's) Hall.*—Professor W. Q. KENNEDY, F.R.S., on "The Mountains of the Moon" January 18th. Dr J. V. HARRISON, M.A., on "The High Andes" February 17th. *Berkeley (St Andrew's) Hall.*—Mr JAMES FISHER, M.A., on "The Fulmar" December 16th. Children's Hogmanay Film Show, December 31st. Dr F. FRASER DARLING, F.R.S.E., on "Alaska To-day" March 17th. *Maclellan Gallery Hall.*—Mr HEINRICH HARRER, on "Seven Years in Tibet," February 8th.

DUNDEE. *Training College.*—Dr N. MILLER, on "The South Western United States" December 14th. Professor W. Q. KENNEDY, F.R.S., on "The Mountains of the Moon" January 20th. Dr J. V. HARRISON, M.A., on "The High Andes" February 15th. Dr F. FRASER DARLING, F.R.S.E., on "Alaska To-day" March 15th.

ABERDEEN. *Y.M.C.A. Hall.*—Dr A. GORDON BEATTIE, M.B., Ch.B., on "Western Journey" December 15th. Professor W. Q. KENNEDY, F.R.S., on "The Mountains of the Moon" January 19th. Dr J. V. HARRISON, M.A., on "The High Andes" February 16th. Dr F. FRASER DARLING, F.R.S.E., on "Alaska To-day" March 16th. *Music Hall.*—Mr HEINRICH HARRER, on "Seven Years in Tibet" February 9th.

NEWBIGIN PRIZE: 1954 AWARD

A Bronze Medal and Money Prize will be awarded for the best Essay, suitable for publication in *The Scottish Geographical Magazine* and not exceeding 7000 words in length, on any subject relating to the geography of Scotland.

Essays, typed and with any illustrations prepared for reproduction, in envelopes marked "Newbigin Prize", must be lodged with the Secretary, Royal Scottish Geographical Society, Synod Hall, Edinburgh 1, on or before 31st October 1954.

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